(b)

No. 99-95-CFX Title: Excel Communications, Inc., et al., Petitioners
v.
AT&T Corp.

Docketed: July 13, 1999 Court: United States Court of Appeals for the Federal Circuit

Entry	Date	Proceedings and Orders
	Jul 13 1999	Petition for writ of certiorari filed. (Response due August 12, 1999)
	Jul 13 1999	Appendix of petitioner filed.
	Aug 12 1999	Brief of respondent AT&T Corp. in opposition filed.
	Aug 24 1999	Reply brief of petitioners Excel Communications, Inc., et al. filed.
	Aug 25 1999	DISTRIBUTED. September 27, 1999
	Oct 4 1999	REDISTRIBUTED. October 8, 1999
	Oct 12 1999	Petition DENIED. Statement of Justice Stevens respecting the denial of the petition for writ of certiorari. (Detached opinion.) Justice O'Connor OUT.

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Supreme Court, U.S.
FILED
JUL 13 1999
OFFICE OF THE CLERK

No. 99 95

IN THE
Supreme Court of the United States

EXCEL COMMUNICATIONS, INC.,
EXCEL COMMUNICATIONS MARKETING, INC.,
AND EXCEL TELECOMMUNICATIONS, INC.,
Petitioners,

v.

AT&T CORP.,
Respondent.

Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

PETITION FOR A WRIT OF CERTIORARI

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July 13, 1999

WILSON - EPES PRINTING CO., INC. - 789-0096 - WASHINGTON, D.C. 20001

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QUESTION PRESENTED

Whether—despite the long-established prohibition on patenting of laws of nature, natural phenomena, and abstract ideas, including mathematical formulas and algorithms—a method of manipulating data according to a mathematical operation constitutes a patentable process under 35 U.S.C. § 101 solely because the answer produced by the method has a useful application.

PARTIES TO THE PROCEEDING AND RULE 29.6 STATEMENT

Petitioners Excel Communications, Inc., Excel Communications Marketing, Inc., and Excel Telecommunications, Inc., and respondent AT&T Corp. are the only parties to this proceeding.

Excel Communications, Inc., which wholly owns Excel Communications Marketing, Inc. and Excel Telecommunications, Inc., is wholly owned by Teleglobe, Inc. Teleglobe, Inc. has publicly held stock.

Bell Canada, a publicly held company, owns more than 10 percent of the stock of Teleglobe, Inc.

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Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

PETITION FOR A WRIT OF CERTIORARI

The Federal Circuit has adopted a new standard that dramatically expands the scope of patentable subject matter (under 35 U.S.C. § 101) to cover pure processes of manipulating data according to mathematical formulas or algorithms. The new standard, which requires no more than some practical usefulness of the result of the mathematical manipulation, was suggested in *dicta* in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998), *cert. denied*, 119 S. Ct. 851 (1999). That case, however, actually involved a particular kind of machine, not a process (and respondent opposed certiorari for precisely that limiting reason). In the present case, the Federal Circuit squarely established this new standard as the governing law by announc-

ing that it applies (and by applying it) to pure method claims.

The Federal Circuit's new "usefulness" standard is a repudiation of the far more limiting "transformation or reduction" standard set forth in this Court's precedents, the most recent of which pre-dates the formation of the Federal Circuit in 1982. The Federal Circuit has all but expressly acknowledged that its new standard simply treats key precedents of this Court as effectively outmoded, and therefore no longer worthy of being followed. There can be no doubt, moreover, of the sharpness of the change in governing standards wrought by the Federal Circuit: in the year since *State Street*'s *dicta*, the U.S. Patent and Trademark Office (PTO) has seen a dramatic increase in applications for software patents.

The Federal Circuit's decision effects a conceded "sea-change" in the fundamental standards for patentability in a vital sector of the economy. Pet. App. 8a. Because it has an undisputed practical impact, defies this Court's precedents, and is unsupported by any new congressional direction to rewrite the governing principles, the new standard should not be allowed to take hold by the unreviewed action of the Federal Circuit. Accordingly, petitioners (collectively "Excel") respectfully petition this Court to review the judgment of the United States Court of Appeals for the Federal Circuit in this case.

OPINIONS BELOW

The opinion of the court of appeals (Pet. App. 1a-19a) is reported at 172 F.3d 1352. The memorandum opinion, order, and final judgment of the district court (Pet. App. 20a-36a) are not reported.

JURISDICTION

The judgment of the court of appeals was entered on April 14, 1999. The jurisdiction of this Court is invoked under 28 U.S.C. § 1254(1).

STATUTORY PROVISIONS INVOLVED

35 U.S.C. § 100(b) provides:

> The term "process" means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.

35 U.S.C. § 101 provides:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

STATEMENT OF THE CASE

A. The Patent at Issue

AT&T's patent involves an elementary mathematical operation that is useful in (among other things) long-distance telephone programs like MCI's "Friends and Family" that charge less when the originating number and terminating number have their long distance calls carried by the same long-distance company. The "technological" background is simple. According to the '184 patent, when a long-distance telephone call is made from one telephone line (the originating number) to another (the terminating number), certain pieces of basic information are generated in the telecommunications network composed of switches and telephone lines. In addition to the originating and terminating numbers themselves, a computer check of a database identifies the long-distance company assigned to carry calls for any given number, the so-called "primary interexchange carrier" (PIC) for that number. All of these pieces of information are recorded in the electronic record of the call (the "message record") generated by the switch for later billing or other purposes.

AT&T's patent uses the term "PIC indicator" as the name for the answer to the following question: is the

terminating number's PIC the same as a "predetermined" PIC? If the "predetermined" PIC in this question is the originating number's PIC, the PIC indicator simply gives the answer to the question: does the same long-distance carrier carry the long-distance calls for both of the two numbers ot the phone call? Moreover, the "predetermined" PIC, the one to which the terminating number's PIC is being compared, can also be a specific designated long-distance carrier, such as AT&T, MCI/Worldcom, or Sprint, in which case the "PIC indicator" is the answer to the question: does a specific designated long-distance carrier carry the long-distance calls for the terminating number? Regardless of what the "predetermined" PIC is, the PIC indicator is nothing more than a "yes" (or its equivalent) if a match in comparing two numbers or data is found, a "no" (or its equivalent) if not. *See* Patent Document Appendix, Figs. 3 and 7 (truth tables). As the Federal Circuit recognized, this method of generating the PIC indicator is simply an implementation of the most basic logical operation, the AND operation of Boolean mathematics) (familiar from, *e.g.*, Westlaw and Lexis searches for "Word A and Word B"). Pet. App. 12a ("Excel argues, correctly, that the PIC indicator value is derived using a simple mathematical principle (p and q).").[1]

[1] Expressed symbolically as "$p \wedge q$," this principle results in "a proposition that is true precisely when both p and q are true, and is false otherwise." ENCYCLOPEDIA OF COMPUTER SCIENCE at 136 (Anthony Ralston *et al.* eds., 1993). The AND operator functions according to the following "truth table":

p	q	$p \wedge q$
0	0	0
0	1	0
1	0	0
1	1	1

IEEE STANDARD DICTIONARY OF ELECTRICAL AND ELECTRONIC TERMS 33 (6th ed. 1996).

In 1994, AT&T obtained U.S. Patent No. 5,333,184 (the '184 patent) for the "method" of including the PIC indicator—the yes/no answer to the simple comparison of data—in the record of a long-distance call. In Claim 1, AT&T claimed as its invention:

> A method for use in a telecommunications system in which interexchange calls initiated by each subscriber are automatically routed over the facilities of a particular one of a plurality of interexchange carriers associated with that subscriber, said method comprising the steps of:
>
> generating a message record for an interexchange call between an originating subscriber and a terminating subscriber, and
>
> including, in said message record, a primary interexchange carrier (PIC) indicator having a value which is a function of whether or not the interexchange carrier associated with said terminating subscriber is a predetermined one of said interexchange carriers.

Claim 6 is slightly narrower, requiring, in addition to the recording process of Claim 1, the further step of "billing at least ones [sic] of said calls as a function of the value of the PIC indicator in the message record generated for each one of those calls." Patent Document Appendix at 7. None of the claims at issue describes a physical apparatus or machine. They are pure method claims.[2]

B. District Court Proceedings

Excel sells long-distance telephone services. It owns no switches or transmission facilities of its own, but contracts with facilities-based carriers like MCI to carry the long-distance calls made by Excel customers. "Switchless re-

[2] This litigation involves ten of the '184 patent's 41 claims (numbers 1, 4, 6, 12, 13, 15, 18, 19, 21, and 40), all method claims.

sellers" like Excel are regulated as common carriers under the Communications Act of 1934, 47 U.S.C. § 151 *et seq.*

On August 30, 1996, AT&T filed suit in the United States District Court for the District of Delaware, invoking jurisdiction under 28 U.S.C. §§ 1331 and 1338 and charging Excel with infringing certain claims of the '184 patent. Excel denied liability and counterclaimed for a declaration that the asserted claims of the '184 patent are invalid and not infringed. On December 5, 1997, Excel moved for summary judgment of invalidity, arguing, among other things, that AT&T's method claims were not patentable subject matter under 35 U.S.C. § 101.

On March 27, 1998, the district court granted Excel's motion for summary judgment of invalidity for lack of patentable subject matter. Pet. App. 34a-36a. The court followed the established standards recognizing that mathematical algorithms, as a kind of abstract idea or law of nature, are outside the ambit of patentable subject matter under Section 101. Specifically, the court relied on this Court's *Benson-Flook-Diehr* trilogy (*Gottschalk v. Benson*, 409 U.S. 63 (1972); *Parker v. Flook*, 437 U.S. 584 (1978); *Diamond v. Diehr*, 450 U.S. 175 (1981)) for the principle that the "clue to patentability" of a process making use of a mathematical algorithm is whether the process involves the "[t]ransformation and reduction of an article 'to a different state of thing.'" Pet. App. 30a. The district court also sought guidance from the decisions of the Federal Circuit and its predecessor, the Court of Customs and Patent Appeals, implementing the rule set forth under *Benson*, *Flook*, and *Diehr*. In particular, the district court noted that

> [a]mong its various attempts to articulate the test for § 101 patentability, the Federal Circuit in *In re Schrader* stated that "[t]he dispositive issue" in reviewing patentability under § 101 "is whether the claim as a whole *recites sufficient physical activity to* constitute patentable subject matter."

Pet. App. 31a (emphasis added) (quoting *In re Schrader*, 22 F.3d 290, 294 n.9 (Fed. Cir. 1994), citing *In re Grams*, 888 F.2d 835, 839 (Fed. Cir. 1989)).

The district court applied those principles to invalidate AT&T's process claims in this case. Explaining that "the crux of the invention is to include a 'PIC indicator' on the standard EMI [electronic message interface] message record" and that the PIC indicator is the product of a simple mathematical operation, the court determined that the claims at issue at the very least "implicitly recite a mathematical algorithm." Pet. App. 25a, 32a. The court then concluded that the claimed method lacks any physical steps in connection with generating a PIC indicator, that the PIC information itself was not physically changed or transformed in any substantive way by the claimed method, and that the mere recording of the PIC indicator in telecommmunication switches and computers did not add anything that would impart patentability under Section 101. Pet. App. 33a-34a. The district court accordingly entered judgment of invalidity under Section 101.

C. Court of Appeals Decision

The court of appeals reversed. Prior to completion of the briefing on appeal, the Federal Circuit issued its *State Street* decision. There, the Federal Circuit proposed that determining the patentability of claims employing a mathematical algorithm should focus "on the essential characteristics of the subject matter, in particular, its practical utility." 149 F.3d at 1375. In that regard, the court explained that "[u]npatentable mathematical algorithms are identifiable by showing they are merely abstract ideas constituting disembodied concepts or truths that are not 'useful.' From a practical standpoint, this means that to be

patentable an algorithm must be applied in a 'useful' way." *Id.* at 1373.

The court in *State Street* repudiated the longstanding *Freeman-Walter-Abele* test (*see In re Freeman*, 573 F.2d 1237 (C.C.P.A. 1978); *In re Walter*, 618 F.2d 758 (C.C.P.A. 1980); *In re Abele*, 684 F.2d 902 (C.C.P.A. 1982)), which had been "adopted by th[e] court, to extract and identify unpatentable mathematical algorithms in the aftermath of *Benson* and *Flook*." 149 F.3d at 1374.[3] According to *State Street*, that test now "has little, if any, applicability to determining the presence of statutory subject matter." *Id.* In reaching that result, the court explained that "after *Diehr* and [*In re*] *Alappat*[, 33 F.3d 1526 (Fed. Cir. 1994) (en banc)], the mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, would not render it nonstatutory subject matter, unless, of course, its operation does not produce a 'useful, concrete and tangible result.'" *Id.*

To the extent that the pronouncements in *State Street* purported to reach process claims, they were *dicta*, because the patent at issue in *State Street* actually was for a machine—and not just for some abstractly characterized machine that added nothing of significance to a process. The claims were written in "means plus function" form under 35 U.S.C. § 112, ¶ 6, so that, by definition, they were limited to the specific machine described in the written description part of the patent plus equivalents. *See Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 27-28 (1997) (discussing Section 112, ¶ 6). Pure method claims, involving no specific apparatus at

[3] The *Freeman* formulation was based on this Court's *Benson* decision. *Walter* then adapted it to reflect this Court's subsequent *Flook* decision. *Abele* further adopted the formulation after this Court decided *Diehr*.

all, but only a sequence of steps, were not at issue in *State Street*. The patentee, having originally included method claims in its application to the PTO, dropped those claims specifically to avoid rejection under Section 101.[4]

In this case, the Federal Circuit took the *State Street* pronouncements, made in the context of apparatus claims, and established them as the law for pure process claims, applying them to uphold the validity of the method claims of AT&T's patent. The court recognized that the data comparison to derive the PIC indicator was simple Boolean mathematics (Pet. App. 12a), but it then noted that "[t]he PIC indicator represents information about the call recipient's PIC, a useful, non-abstract result that facilitates differential billing of long-distance calls" (Pet. App. 13a). *See also* Pet. App. 12a (stating that "AT&T's claimed process employs subscribers' and call recipients' PICs as data, applies Boolean algebra to those data to determine the value of the PIC indicator, and applies that value through switching and recording mechanisms to create a signal useful for billing purposes"). The usefulness of the result of the Boolean operation, the court held, was legally sufficient to permit patenting under Section 101. "Because the claimed process applies the Boolean principle to produce a useful, concrete, tangible result without pre-empting other uses of the mathematical principle, on its face the claimed process comfortably falls within the scope of § 101." Pet. App. 13a.

[4] The court in *State Street* noted that the original patent application contained six "machine claims" and six method claims. The applicant had canceled the six method claims because "during prosecution the examiner contemplated a § 101 rejection for failure to claim statutory subject matter" 149 F.3d at 1371. Like the asserted claims of the present case, the canceled claims in *State Street* were method claims defined by steps involving receiving, processing, and storing data.

In reaching this conclusion, the court deemed it irrelevant that AT&T was not claiming the use of a mathematical operation to produce a physical transformation of any specified physical things—in contrast, for example, to the steps for curing rubber that were involved in *Diehr*. *See* Pet. App. 12a-14a. In generating a PIC indicator by comparing PIC data according to a mathematical operation, the claimed method does not physically change the underlying PIC data itself into something else; it merely records the answer to a mathematical question (in an unspecified format or apparatus). In decisions before this case and *State Street*, the Federal Circuit and its predecessor had recognized, in discussing pure process claims, that mere usefulness of a mathematical algorithm, mere recording of the result of such an algorithm, mere use of a generically referenced computer (which always involves some internal transformation of electrical states), and mere restriction of the field of use of an algorithm—all these were insufficient to take a mathematical process outside the public domain. *See In re Sarkar*, 588 F.2d 1330, 1335 (C.C.P.A. 1978); *In re Walter*, 618 F.2d at 769-70; *Schrader*, 22 F.3d at 294; *Arrhythmia Research Tech. v. Corazonix Corp.*, 958 F.2d 1053, 1057 (Fed. Cir. 1992); *see also In re Warmerdam*, 33 F.3d 1354, 1360 (Fed. Cir. 1994). Nevertheless, the Federal Circuit in this case deemed the practical usefulness of the recorded result of the data comparison sufficient to allow the process to be claimed in a patent and thus removed from the public domain.

REASONS FOR GRANTING THE PETITION

This case raises an important and fundamental question of patent law that this Court has not addressed in nearly two decades. The Federal Circuit has for the first time held that any pure method, even execution of a mathematical algorithm, constitutes patentable subject matter

as long as the result of the operation has a practical utility. This standard works a major change in the law, as it sweeps aside the pre-existing law of the Federal Circuit.

Lacking recent guidance, the Federal Circuit felt free to declare this Court's precedents outmoded and thus to supersede them. Notably, it repudiated this Court's repeatedly affirmed principle, emphasized in the 1981 *Diehr* decision itself (this Court's most recent decision on this issue), that the touchstone for patentability of a process that uses a mathematical algorithm is whether the process effects a physical transformation of an article into a different state or thing (like the rubber-curing process in *Diehr*). Moreover, what the Federal Circuit put in place —requiring only practical utility of the result of the mathematical operation—is essentially no standard at all, thus effectively erasing the longstanding bar on patenting of mathematical operations.

The magnitude of the change in law worked by the new Federal Circuit standard is already evident. There has been a dramatic increase in software patent filings in the U.S. Patent and Trademark Office since *State Street* —in an area where prior art is not readily available for the usual process of PTO examination to ensure novelty and nonobviousness. More generally, the new standard will permit the patenting of a host of computer-implemented methods that until now have remained beyond the reach of the exclusive rights granted under the patent laws. This kind of change should not be allowed to stand unreviewed by this Court.

I. The Federal Circuit Has Definitively And Dramatically Broken With Its Own Precedents In Now Extending Patent Protection To All Methods, Even Mathematical Algorithms, As Long As They Are Applied In A Useful Way

The Federal Circuit's ruling in this case is a watershed event in the standards for patentability of pure *processes* that involve mathematical operations. The Federal Circuit signaled the change as *dicta* in 1998 and adopted it here. The new standard, demanding only utility of the mathematical method, intentionally and unquestionably breaks sharply with pre-existing limits on patentability.

1. Until 1998, the Federal Circuit and its predecessor followed the analytical path marked out by this Court prior to 1981. They demanded, for patentability of a process involving mathematical operations, that the claimed process involve "physical . . . process steps." The standard approach, known as the *Freeman-Walter-Abele* test, incorporated two steps:

> First, the claim is analyzed to determine whether a mathematical algorithm is directly or indirectly recited. Next, if a mathematical algorithm is found, the claim as a whole is further analyzed to determine whether the algorithm is "applied in any manner to physical elements or process steps," and, if it is, it "passes muster under § 101."

In re Pardo, 684 F.2d 912, 915 (C.C.P.A. 1982) (quoting *Walter*, 618 F.2d at 767); *see In re Meyer*, 688 F.2d 789, 796 (C.C.P.A. 1982).

In 1998, after a period of almost five years of quiet on the subject, the Federal Circuit "reassessed" the patentability of mathematical algorithms in *State Street*. Pet. App. 9a. The only claims actually at issue were "directed to a machine," in accordance with 35 U.S.C. § 112, ¶ 6, namely, "a data processing system for managing a financial services configuration of a portfolio established as a partnership, which machine is made up of, at the very least, the specific structures disclosed in the written description and corresponding to the means-plus-function elements . . . recited in the claim." *State Street*, 149 F.3d at 1371, 1372. The patentee had, in fact, canceled its initially proposed *process* claims during prosecution of the patent application, after the PTO questioned their patentability under Section 101. *See* note 4, *supra*. The Federal Circuit, recognizing that "[a] 'machine' is proper statutory subject matter under § 101" (149 F.3d at 1372), held that the claimed machine did not fall within any of the unpatentable categories of laws of nature, natural phenomena, or abstract ideas, including mathematical operations, because it was a new and useful machine capable of producing a concrete and tangible result to solve a practical problem. *Id.* at 1373.

Although only a machine was at issue in *State Street* (as was also the case in the 1994 *Alappat* decision), the *State Street* court did not confine its discussion to machines. Rather, it proposed to alter the test for the patentability of even pure processes that use a mathematical algorithm, requiring only that the algorithm be "applied in a 'useful' way." *Id.* at 1373. Acknowledging that the "*Freeman-Walter-Abele* test was designed by the Court of Customs and Patent Appeals, and subsequently adopted by this court, to extract and identify unpatentable mathematical algorithms in the aftermath of *Benson* and *Flook*," the Federal Circuit nevertheless stated that, today, this "test has little, if any, applicability to determining the presence of statutory subject matter." *Id.* at 1373-74.

When certiorari was sought to review *State Street* and its pronouncements purporting to change the legal standards under Section 101 (Case No. 98-657), the patentee, in opposing certiorari, relied centrally and repeatedly on

the fact that the case actually involved a machine, not a process.[5] That distinction—which was critical to sidestepping the importance (and incompatibility with this Court's precedents) of the *dicta* suggesting new patentability standards for processes [6]—was well founded in logic and precedent. Mathematical algorithms are themselves a type of "process," not a "machine, manufacture, or composition of matter" (§ 101), so the latter categories do not implicate the longstanding prohibition on patenting algorithms (unless they are so generically identified as to add nothing substantial).[7] Not surprisingly, then, challenges to patentability of machines, as in *State Street*,

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[5] According to the patentee (respondent), "the question posed by State Street is solely an academic question and granting the writ would bring before this Court a hypothetical issue that the Federal Circuit did not decide." 98-657 Br. in Opp. 7; *see also id.* at i (rewriting question presented to stress "machine"), 5 ("The Question Presented by State Street Is Hypothetical and Was Not Determinative of the Federal Circuit's Decision"; State Street's entire argument for certiorari is based upon a flawed reading of the Federal Circuit's decision."), 6-7 (stressing that Federal Circuit's decision was limited to "a new 'machine' and not a 'process' "; "State Street distorts selected dicta to create an issue that was not before the Federal Circuit.").

[6] Counsel for the patentee in *State Street* has recently acknowledged that the new utility standard, as applied to processes, cannot reasonably be squared with this Court's decisions in *Flook* and *Benson*. *See* note 10, *infra*.

[7] *See In re Noll*, 545 F.2d 141, 148 (1976) (apparatus claims cannot read on an algorithm itself); *see also Alappat*, 33 F.3d at 1545 ("a computer . . . is apparatus not mathematics"). The Federal Circuit and its predecessor court have questioned whether the "mathematical algorithm" exception even applies to apparatus claims. 33 F.3d at 1542 (noting that "the PTO has failed to support the premise that the 'mathematical algorithm' exception applies to true apparatus claims"); *In re Johnston*, 502 F.2d 765, 771 (C.C.P.A. 1974) (holding that the "mathematical algorithm" exception does not apply to apparatus claims), *rev'd on other grounds*, *Dann v. Johnston*, 425 U.S. 219 (1976).

have routinely failed.[8] This Court denied the petition in *State Street*. 119 S. Ct. 851 (1999).

After certiorari was denied in *State Street*, the Federal Circuit in this case took the decisive step of crossing the machine-process line and elevating the *dicta* about processes in *State Street* into a holding. The Federal Circuit not only announced the new usefulness test but applied it to uphold the patentability of the method claims at issue here. In rationalizing its abandonment of the conventional physical limitations test, the court echoed its reasoning from *State Street* that, "[w]hatever may be left of the earlier test, if anything, this type of physical limitations analysis seems of little value" any longer. Pet. App. 15a. The Federal Circuit's decision in this case thus established the transformation of Section 101 principles as the governing law for pure software and other process claims.

2. This new utility standard for patentability of pure processes that are nothing but mathematical operations is a sharp break from the pre-existing law. The Federal Circuit acknowledged the "reassessment" of standards in this case. Pet. App. 8a-9a. And it is clear that the new standard repudiates the Federal Circuit's pre-1998 analysis and pre-1998 holdings regarding claims for pure processes that involved mathematical algorithms.

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[8] It appears that challenges have failed in *every* reported instance in which the patentability of a true apparatus claim under Section 101 was at issue. *E.g.*, *State Street*, 149 F.3d 1368 (personal computer for managing financial services configuration); *Alappat*, 33 F.3d at 1541 ("a machine, namely, a rasterizer"); *Arrhythmia Research Tech. v. Corazonix Corp.*, 958 F.2d 1053 (Fed. Cir. 1992) (machine for analyzing electrocardiographic signals); *In re Iwahashi*, 888 F.2d 1370 (Fed. Cir. 1989) (machine: an auto-correlation unit); *In re Bradley*, 600 F.2d 807 (C.C.P.A. 1979) (computer), *aff'd*, 450 U.S. 381 (1981); *In re Johnston*, *supra* (record keeping machine consisting of a programmed digital computer).

Most recently, in *In re Schrader*, 22 F.3d 290, 295 (Fed. Cir. 1994), which invalidated a patent on this ground, the Federal Circuit embraced "[t]he requirement that in a process claim compliance with § 101 requires some kind of transformation or reduction of subject matter." The court explained:

> When Congress approved the addition of the term "process" to the categories of patentable subject matter in 1952, it incorporated the definition of "process" that had evolved in the courts. As of 1952, *that term included a requirement that there be a transformation or reduction of subject matter.*

Id. (emphasis added). "This basic requirement preceded and remains a part of the requirements incorporated in the 1952 Act." *Id.*

The requirement of a physical transformation or reduction had been stated in *Abele*, the third of the *Freeman-Walter-Abele* trilogy, after this Court's last pronouncement on the subject in the 1981 *Diehr* decision. *See Abele*, 684 F.2d at 906. Following that principle, moreover, the Federal Circuit and its predecessor, in discussing pure process claims, had repeatedly stated that mere usefulness of a mathematical algorithm, mere recording of the result of such an algorithm, mere use of a generically referenced computer, and mere restriction of the field of use of an algorithm were insufficient to take a mathematical process outside the public domain. *See In re Sarkar*, 588 F.2d at 1335; *Walter*, 618 F.2d at 769-70; *Arrhythmia Research*, 958 F.2d at 1057; *Schrader*, 22 F.3d at 294; *In re Warmerdam*, 33 F.3d at 1360-61; *In re Grams*, *supra*. The Federal Circuit's new standard renders those limitations a dead letter.

The Federal Circuit all but explicitly acknowledged in this case that its new usefulness test cannot be reconciled

with prior governing standards, reflected in at least three decisions invalidating pure process claims after *Diehr*, namely, *In re Grams*, *In re Schrader*, and *In re Warmerdam*. *See* Pet. App. 16a-17a. It made no attempt to explain how the holdings of those cases could be squared with its new test. As to the first two, the court merely declared them "unhelpful" because they did not apply the mere "useful result" standard as a sufficient test for patentability. *Id.* That dismissal, being entirely circular, is another form of words stating that the standards of *Grams* and *Schrader* are incompatible with the new standard. As to *Warmerdam*, the court simply threw up its hands, making no effort to identify a principle that would accommodate the earlier invalidity holding: the court refused even to ask what features were missing from the claims there that would distinguish them from unpatentable mathematical operations or whether the same features were missing here.

In fact, what was missing in all three cases was sufficient physical activity or transformation, and all three of the cases would have been decided differently under the new usefulness standard. In *Grams*, whereas the diagnosing method at issue was held unpatentable because it recited no physical steps except for merely gathering data for the mathematical algorithm, the algorithm clearly produced a useful, concrete, and tangible result, *i.e.*, an indication whether a system's condition is normal or abnormal, and, if it is abnormal, the cause of the abnormality. 888 F.2d at 836. Similarly, in *Schrader*, whereas the claimed method for competitive bidding on multiple auction items was held unpatentable because it failed to recite sufficient physical activity or transformation of data. the mathematical algorithm underlying the bidding method was manifestly applied in a useful way, *i.e.*, in conducting auctions. 22 F.3d at 291, 293-94. Finally, in *Warmer-*

dam, whereas the claimed method was held unpatentable because it was "mathematical in nature" and did not recite a sufficient level of physical activity to impart patentability (33 F.3d at 1360),[9] the method was indisputably and directly useful in controlling the motion of robotic machines to avoid collisions with other moving or fixed objects. *Id.* at 1355. The Federal Circuit's decision in this case unquestionably makes a dramatic change in the pre-existing legal standards to permit patenting of what previously belonged in the public domain.

II. The New Practical Utility Standard Repudiates The Governing Precedents Of This Court

The Federal Circuit's new usefulness standard for identifying patentable methods is a repudiation of this Court's precedents. This Court has made clear that patentability of an otherwise nonstatutory method claim is not saved by reciting a practical application of the method. At the same time, the Court has stressed that, to distinguish an unpatentable mathematical process from a patentable technological one, the touchstone is that the claims describe a process for physically transforming a physical article or reducing it to a different state or thing. The Federal Circuit's decision casts away these principles and adopts a standard that is inconsistent with both the results and rationales of several of this Court's decisions. And, contrary to the Federal Circuit's core assumption (belied by 20 years of Federal Circuit case law), neither the principles nor the holdings of those decisions were abrogated by this Court in *Diehr*.

1. This Court flatly concluded in its 1978 decision in *Flook*: "if a claim is directed essentially to a method of

[9] By contrast, the court concluded that a different claim, for a *machine*, in *Warmerdam* was "clearly patentable subject matter." *Id.* at 1360.

calculating, using a mathematical formula, *even if the solution is for a specific purpose*, the claimed method is nonstatutory." 437 U.S. at 595 (emphasis added) (citing *In re Richman*, 563 F.2d 1026, 1030 (C.C.P.A. 1977)). The Court reiterated *Flook*'s rejection of a usefulness standard in the course of its general discussion of patentability in *Diamond v. Chakrabarty*, 447 U.S. 303 (1980), confirming that *Flook* "applied [the Court's] prior precedents to determine that a 'claim for an improved method of calculation, *even when tied to a specific end use*, is unpatentable subject matter under § 101.'" 447 U.S. at 315 (emphasis added). The Federal Circuit's new standard is directly to the contrary.

The new standard also discards the longstanding requirement of a physical transformation for patentability of a "process" (a term expressly used in Section 101 since 1952, having previously been covered by the prior statutory term "art," *see Diehr*, 450 U.S. at 182). This Court and the leading treatise articulated that requirement for processes even before 1900. *See Cochrane v. Deener*, 94 U.S. 780, 787-88 (1877) ("A process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing"); 1 William C. Robinson, THE LAW OF PATENTS FOR USEFUL INVENTIONS § 159 (1890) (stating that a patentable process "is an act or a series of acts performed by some physical agent upon some physical object, and producing in such object some change either of character or of condition"). In the 1972 decision in *Benson*, this Court confirmed this settled principle, stating that the "[t]ransformation and reduction of an article 'to a different state or thing' *is the clue to the patentability* of a process claim that does not include particular machines." *Benson*, 409 U.S. at 70 (emphasis added).

The Federal Circuit's usefulness standard not only flouts this Court's articulated standards but contradicts the holdings of *Benson* and *Flook*, which would have come out differently under the new Federal Circuit standard.[10] In *Benson*, the algorithm used to convert binary-coded decimal numerals into pure binary numerals produced obviously useful results: numerals that could be used in the electronic on-off circuits on which digital computers are based. 409 U.S. at 64, 71; *see also Diehr*, 450 U.S. at 185 (the "sole practical application of the algorithm [in *Benson*] was in connection with the programming of a general purpose digital computer"); *Flook*, 437 U.S. at 590 n.11 (in "*Benson* there was a specific end use contemplated for the algorithm—utilization of the algorithm in computer programming"). The usefulness of the algorithm in computer applications would be enough under the Federal Circuit's standard. This Court held, however, that the claimed method was merely an abstract idea and so was not protectable under the patent laws.

In *Flook*, the algorithm for computing numerical "alarm limits" produced a useful result: indeed, these numbers generated by the algorithm were specifically intended to have a practical application in chemical processes involving catalytic conversion. 437 U.S. at 586. That utility

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10 Counsel for State Street Bank & Trust Co. (the patentee in *State Street*) has admitted as much in recent public statements to the patent bar. According to State Street's counsel, "[w]e believe that *Benson* was wrongly decided. Under *State Street*, it is hard to imagine a more useful 'real world' application of an algorithm than the *Benson* invention which is now a critical widespread part of computer technology." Steven L. Friedman et al., *State Street Bank and Trust Company v. Signature Financial Group, Inc.: At the Intersection of Technology, Commerce and the Law*, AMERICAN BAR ASSOCIATION SECTION OF INTELLECTUAL PROPERTY LAW NEWSLETTER (Spring 1999) 16 n.1. Similarly, "[l]ike *Benson*, . . . we believe *Parker* would come out in reverse under [the Federal Circuit's] analysis in *State Street*." *Id.* at 16 n.4.

would be enough under the Federal Circuit's standard. This Court held, however, that the method claims were unpatentable because they claimed nothing more than abstract ideas. *Id.* at 594-95.

2. The Federal Circuit did not seriously contest the inconsistency of its new standard with *Benson* and *Flook*. Instead, the court presumed that, subsequent to those decisions, "[i]n *Diehr*, the Court expressly limited its two earlier decisions in *Flook* and *Benson*." Pet. App. 9a. This revisionist reading of *Diehr*, after 20 years, contradicts the Federal Circuit's own recognition that "*Benson* remains the law. Indeed, *Benson* is cited in both *Diehr* and *Chakrabarty*, with no apparent attempt in either opinion to overrule or disapprove of it." *Grams*, 888 F.2d at 838; *see also Warmerdam*, 33 F.3d at 1358 (citing *Diehr* with approval as support for the continuing viability of *Benson* and *Flook*). And this new view of *Diehr* is wrong: nothing in *Diehr* even purports to overrule *Benson* and *Flook* or disavow their results; to the contrary, *Diehr* strongly confirms the principles *Benson* and *Flook* articulate in each respect that is critical to the present case.

At the most general level, *Diehr* treats *Benson* and *Flook* as proper applications of the basic exclusion of laws of nature and abstract ideas, including mathematical algorithms, from the protection of the patent laws. Thus, *Diehr* reaffirms the principle that "laws of nature, natural phenomena, and abstract ideas" are "free to all men and reserved exclusively to none" and that included within those unpatentable categories are mathematical algorithms, formulas, and/or equations. 450 U.S. at 185-86. And far from declaring *Benson* and *Flook* to be wrong, *Diehr* explains their results as applications of "these long-established principles." 450 U.S. at 185; *see id.* at 185-87.

More specifically, *Diehr*, far from disavowing the physical-transformation test, specifically relies on that test to uphold patentability. *Diehr* quotes with approval the statements of the 1877 *Cochrane* decision and the 1972 *Benson* decision that a patentable "process" is one "performed upon the subject-matter to be transformed and reduced to a different state or thing" (*Cochrane*, 94 U.S. at 787-88) and that "[t]ransformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines" (*Benson*, 409 U.S. at 70). *Diehr*, 450 U.S. at 183-84. The decision then affirms the patentability of the respondents' process claims by "[a]nalyzing respondents' claims according to the above statements from our cases" and concluding that the claimed "physical and chemical process for molding precision synthetic rubber products" is patentable precisely because the claimed process "involve[s] the transformation of an article, in this case raw, uncured synthetic rubber, into a different state or thing." *Id.* at 184. *Diehr* thus expressly relies on physical transformation—and articulates no other basis for patentability anywhere else in the opinion—as the ground for upholding the patent against the Section 101 objection. *Diehr* can only be read as reaffirming, rather than abandoning, the physical-transformation test of *Benson* and *Cochrane*.[11]

[11] In its general summary, the Court concludes its opinion by stating: "when a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is "performing a function which the patent laws were designed to protect (*e.g.*, transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of § 101." 450 U.S. at 192. The Federal Circuit fastened on the "*e.g.*" in the parentheses and interpreted it as a repudiation of the physical transformation test as the touchstone of patentability for a process. That interpretation is untenable, given *Diehr's* express reliance on that test as the basis for its decision, the absence of any other articulated test in *Diehr*, and the lack of any justification for concluding—as the Federal Circuit's interpretation does—that the prior decisions in *Cochrane* and *Benson* were being overruled.

Just as *Diehr* leaves in place and reinforces the physical-transformation standard, it also leaves in place and reinforces *Flook*'s recognition that patentability cannot be created for a mathematical operation simply by designating a practical use. Indeed, *Diehr* expressly reaffirms, with a citation to *Flook*, that the principle precluding patenting of mathematical formulas "cannot be circumvented by attempting to limit the use of the formula to a particular technological environment." 450 U.S. at 191. Elaborating, *Diehr* then declares: "A mathematical formula does not suddenly become patentable subject matter simply by having the applicant acquiesce to limiting the reach of the patent for the formula to a particular technological use." *Id.* at 192 n.14. *Diehr* adds: "A mathematical formula in the abstract is nonstatutory subject matter regardless of whether the patent is intended to cover all uses of the formula or only limited uses." *Id.* These declarations, set out specifically to explain *Diehr*'s consistency with *Flook*, can only be read as reaffirming rather than overturning the critical principle of *Flook* that the new Federal Circuit standard disowns.[12]

3. The Federal Circuit's adoption of a usefulness standard in place of a physical transformation standard thus refuses to honor several of this Court's decisions, treating them as effectively defunct. In addition to the fact that those decisions respect historically well-founded limits on what the patent laws allow to be removed from the public

[12] *Diehr* also notes that "a mathematical formula does not become patentable subject matter merely by including in the claim for the formula token postsolution activity such as the type claimed in *Flook*." 450 U.S. at 192 n.14. Recording the answer to the mathematical operation and using the answer to send out a bill are undoubtedly "token postsolution activity."

domain, this Court has in no way overruled them, but instead has reaffirmed them in the critical respects. The Federal Circuit could not properly disregard those precedents, notwithstanding its evident (but hardly explained) conclusion that the time had come for a change in the law. This Court often has made clear that a lower court, while free to criticize, is obligated to follow this Court's precedents until this Court overrules them. *See, e.g., State Oil Co. v. Khan*, 118 S. Ct. 275, 284 (1997) ("The Court of Appeals was correct in applying that principle despite disagreement with [earlier Supreme Court precedent], for it is this Court's prerogative alone to overrule one of its precedents."); *Rivers v. Roadway Express, Inc.*, 511 U.S. 298, 312 (1994) ("It is this Court's responsibility to say what a statute means, and once the Court has spoken, it is the duty of other courts to respect that understanding of the governing rule of law."); *Rodriguez de Quijas v. Shearson/American Express, Inc.*, 490 U.S. 477, 484 (1989) ("If a precedent of this Court has direct application in a case, yet appears to rest on reasons rejected in some other line of decisions, the Court of Appeals should follow the case which directly controls, leaving to this Court the prerogative of overruling its own decisions.").

III. The Federal Circuit's Decision Effects A Major Change In The Law That Should Be Left To Congress

The Federal Circuit's new usefulness standard essentially erases one of the age-old and "rigorous statutory tests for the issuance of a patent." *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 476-77 (1974). Not many mathematical algorithms or formulas (excluding the purest of pure mathematics) would fail to become patentable under the Federal Circuit's new standard. "A competent draftsman could attach some form of post-solution activity to almost any mathematical formula,"

this Court noted in *Flook*, adding that such a result is inconsistent with long-standing limits on patentability: "the Pythagorean theorem would not have been patentable, or partially patentable, because a patent application contained a final step indicating that the formula, when solved, could be usefully applied to existing surveying techniques." 437 U.S. at 590. The new Federal Circuit standard weakens to the point of elimination the historic preservation of mathematical operations for free use by the public.

The practical consequences of the Federal Circuit's new standard for pure process claims, first signaled in *dicta* in *State Street*, are already evident within the PTO. Commentators have reported that "[a]s the aftershock of *State Street* subsides, the avalanche of new software patent issuances and litigation begins." Raymond Van Dyke, *Software Patents Offer Opportunities and Obstacles*, THE NATIONAL LAW JOURNAL at C19 (May 24, 1999). The *State Street* decision "appears to have set off a stampede to the patent office, which reports a 45 percent increase in the number of data processing and computer-related patents issued during its 1998 fiscal year, which ended on Sept. 30." John T. Aquino, *Patently Permissive*, ABA JOURNAL at 30 (May 1999); *see also* Brenda Sandburg, *Speed over Substance?* INTELLECTUAL PROPERTY MAGAZINE (March 1999) ("The number of issued software patents in general has skyrocketed. Software patents are included in the PTO's data processing and computers and communications group. This entire group had the largest increase in issued patents last year, up 40 percent to 22,930 issued patents."); Andrew B. Katz, *"State Street" May Place Start-Ups in Peril*, NEW YORK LAW JOURNAL at C1 (Jan. 19, 1999) (reporting that "the number of software patent applications rose sharply in the few months since *State Street* and the PTO predicts a dramatic increase in the future").

The sharp increase in software patent applications confirms the real-world significance of what the Federal Circuit has done to longstanding limits on patentability. The increase necessarily will continue, and not only because companies throughout the myriad industries where software is important will want the right to exclude that is the essence of patent protection. *See* 35 U.S.C. §§ 154, 271; *see also Florida Prepaid Post-Secondary Education Expense Bd. v. College Savings Bank*, 67 U.S.L.W. 4580, 4584-85 (U.S. 1999). Recognition of patentability also creates pressure within all such industries to seek such patents merely for self-protective purposes.

A large-scale expansion of the scope of what is patentable subject matter, especially one that involves an already-mature technology, implicates just the kind of substantial issues that ought to be left for Congress. In such circumstances, the PTO may have a distinctly limited ability to identify and locate the existing prior art (which patent applicants are under no duty themselves to uncover if not already known), thus curtailing the critical basis for determining whether a patent claim fails the statutory requirements of novelty and nonobviousness (35 U.S.C. §§ 102, 103). This problem affects pure process claims for computer software particularly. "Because software inventions were denied patent protection for so long and so few patents have issued thus far, patent examiners often cannot review previous archived patents in the software arts to assess whether an invention satisfies the requirements of a patent" under Sections 102 and 103 of the patent statute. Van Dyke, *supra*, at C20.[13] The problem is not just unavailability of earlier

[13] The PTO recently conducted hearings on the problems raised by increased software patents, noting that "[e]merging technologies, such as telecommunications and the computer-related arts, present challenges in searching and identifying the most relevant prior art." Notice of Public Hearing and Request for Comments on Issues Related to the Identification of Prior Art During Examination of a Patent Application, 64 Fed. Reg. 28803, 28804-05 (U.S. Patent & Trademark Office May 27, 1999).

patents as prior art, but prior-art literature more generally. *See* David Bender, *Recent Developments in Software Patents* in COMPUTER SOFTWARE PROTECTION (PLI 1997) at 139, 159-60.[14] The built-in tendency is toward an excess of issued patents (because invalidating prior art that exists cannot be found)—patents that then come to court, in any infringement litigation, with a presumption of validity (35 U.S.C. § 282).[15]

More generally, even aside from problems in identifying prior art, the Federal Circuit's decision swinging open the door to pure process claims for software will, by design, introduce new areas of private exclusivity over software in many industries, raising serious questions about

[14] "In most technical areas descriptions of developments quickly become the subject of patent applications, technical journals and eventually textbooks. However, this phenomenon is much less evident in the software arts. Software advances are typically maintained as secrets in-house, or embodied in software packages made available widely, but only in object form. Until the past few years, such developments have not typically been the subject of patents or publications. And even where the public has been permitted to use the development, the public has often been kept ignorant of its content and, consequently, is unable to build upon it."

"One negative ramification of this disinclination to publish and patent is the difficulty of assessing the state of the software art. Thus, patent examiners examining a software-related application are unable to make an accurate assessment of novelty and nonobviousness. If the representation of the prior art to which the patent examiner has access is incomplete, the process results in more patents than it should." *Id.* at 160. *See also id.* at 160-61 (noting recognition of problem in recent formation of organization to try to compile software databases).

[15] In litigation, an accused infringer challenging the validity of the patent generally must meet a "clear and convincing evidence" standard. *See Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1576 (Fed. Cir. 1996).

the consequences for competition and innovation. What protection for pure software is needed beyond what is available from, say, copyright and trade-secret laws? Should patents be issued that merely claim Internet applications of mathematical algorithms? *See, e.g.*, U.S. Patent No. 5,794,207 (patent directed to reverse seller's auction on the Internet); *compare Schrader, supra* (rejection of patent application for novel way of conducting auctions). How will the deliberately lowered standard for patentability affect an industry, like telecommunications, that is highly dependent on software and where Congress has aggressively acted to promote the entry and expansion of new competition? Not surprisingly, "there is widespread angst among companies that use (not just those that produce) cutting-edge software and communication technologies. They are worried that the government is granting exclusive rights in territory that should be open to all, and that expensive, debilitating litigation may decimate their industries." James Pooley, *Defending Internet, Software Patent Claims*, NEW YORK LAW JOURNAL, INTELLECTUAL PROPERTY SECTION at S6 (March 15, 1999).

There is today, as there has been for many decades, a vigorous, continuing debate about the proper standards for legal protection of software, whether through the patent statute or other laws.[16] This debate raises serious,

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[16] *See, e.g.*, REPORT OF THE PRESIDENT'S COMMISSION ON THE PATENT SYSTEM, "TO PROMOTE THE PROGRESS OF . . . USEFUL ARTS" IN AN AGE OF EXPLODING TECHNOLOGY (1966) (recommending against patent protection for computer programs); NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT (1979) (recommending copyright as the form of intellectual property protection for computer programs); OFFICE OF TECHNOLOGY ASSESSMENT, UNITED STATES CONGRESS, FINDING A BALANCE: COMPUTER SOFTWARE, INTELLECTUAL PROPERTY AND THE CHALLENGE OF TECHNOLOGICAL CHANGE (1992) (recommending sui generis approach to software protection); Pamela Samuelson et al., *Symposium: Toward a Third Intellectual Property Paradigm: Article: A Manifesto Concerning the Legal Protection of Computer Programs*, 94 COLUM. L. REV. 2308 (1994) (arguing for a sui generis form of legal protection of computer programs).

delicate policy issues: "[f]ederal interests are threatened, not only by inadequate protection for patentees, but also when overprotection may have an adverse impact on a competitive economy. *See Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 162-163 (1989)." *Florida Prepaid Post-Secondary Education Expense Bd. v. College Savings Bank*, 67 U.S.L.W. 4580, 4586 (U.S. 1999) (Stevens, J., dissenting, joined by Souter, Ginsburg, and Breyer, JJ.). To the extent that long-settled limitations on patentability are to be overturned, it should be done in the legislative arena where the consequences can be explored and risks and benefits balanced. Such a dramatic change should not be made by the Federal Circuit—and certainly should not go unreviewed by this Court.

See also Lawrence Lessig, *The Problem With Patents*, THE INDUSTRY STANDARD (May 3, 1999) (criticizing expansion of patent protection related to electronic commerce; "In a transforming market, it's nearly impossible for anyone—let alone an underpaid worker in the [PTO] who spends an average of eight hours evaluating the prior art in a patent and gets paid based on how many he processes—to identify what's 'novel.' . . . To West Coast coders, it seems bizarre that East Coast coders—the Patent Office—consider [various patented] ideas nonobvious. . . . Washington is obsessed with intellectual-property rights . . . . [O]ur tradition teaches balance and the dangers inherent in overly strong intellectual-property regimes. But balance in IP seems over for now."); National Research Council, INTELLECTUAL PROPERTY ISSUES IN SOFTWARE at 64 (1991) ("Software innovator Bricklin, creator of the original spreadsheet program, VisiCalc, believes that [software patents] could be 'very bad for the industry.' . . . Had patents been available when he and his collaborator developed VisiCalc, Bricklin speculated, their company, Software Arts, would have sought the protection. The consequences of such a decision, he further speculated, would have been to prevent other innovators from exploring different expressions of the spreadsheet idea and to handicap the competition.").

CONCLUSION

The petition for a writ of certiorari should be granted.

Respectfully submitted,

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July 13, 1999

APPENDICES

APPENDIX A

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

98-1338

AT&T CORP.,
Plaintiff-Appellant,

v.

EXCEL COMMUNICATIONS, INC.,
EXCEL COMMUNICATIONS MARKETING, INC.,
and EXCEL TELECOMMUNICATIONS, INC.,
Defendants-Appellees.

Appealed from U.S. District Court for the
District of Delaware
Judge Sue L. Robinson

DECIDED: April 14, 1999

Before PLAGER, CLEVENGER, and RADER, *Circuit Judges.*

PLAGER, *Circuit Judge.*

This case asks us once again to examine the scope of section 1 of the Patent Act, 35 U.S.C. § 101 (1994).

The United States District Court for the District of Delaware granted summary judgment to Excel Communications, Inc., Excel Communications Marketing, Inc., and Excel Telecommunications, Inc. (collectively "Excel"), holding U.S. Patent No. 5,333,184 (the '184 patent) invalid under § 101 for failure to claim statutory subject matter. *See AT&T Corp. v. Excel Communications, Inc.*, No. CIV.A.96-434-SLR, 1998 WL 175878, at *7 (D. Del. Mar. 27, 1998). AT&T Corp. ("AT&T"), owner of the '184 patent, appeals. Because we find that the claimed subject matter is properly within the statutory scope of § 101, we reverse the district court's judgment of invalidity on this ground and remand the case for further proceedings.

BACKGROUND

A.

The '184 patent, entitled "Call Message Recording for Telephone Systems," issued on July 26, 1994. It describes a message record for long-distance telephone calls that is enhanced by adding a primary interexchange carrier ("PIC") indicator. The addition of the indicator aids long-distance carriers in providing differential billing treatment for subscribers, depending upon whether a subscriber calls someone with the same or a different long-distance carrier.

The invention claimed in the '184 patent is designed to operate in a telecommunications system with multiple long-distance service providers. The system contains local exchange carriers ("LECs") and long-distance service (interexchange) carriers ("IXCs"). The LECs provide local telephone service and access to IXCs. Each customer has an LEC for local service and selects an IXC, such as AT&T or Excel, to be its primary long-distance service

(interexchange) carrier or PIC. IXCs may own their own facilities, as does AT&T. Others, like Excel, called "resellers" or "resale carriers," contact with facility-owners to route their subscribers' calls through the facility-owners' switches and transmission lines. Some IXCs, including MCI and U.S. Sprint, have a mix of their own lines and leased lines.

The system thus involves a three-step process when a caller makes a direct-dialed (1+) long-distance telephone call: (1) after the call is transmitted over the LEC's network to a switch, and the LEC identifies the caller's PIC, the LEC automatically routes the call to the facilities used by the caller's PIC; (2) the PIC's facilities carry the call to the LEC serving the call recipient; and (3) the call recipient's LEC delivers the call over its local network to the recipient's telephone.

When a caller makes a direct-dialed long-distance telephone call, a switch (which may be a switch in the interexchange network) monitors and records data related to the call, generating an "automatic message account" ("AMA") message record. This contemporaneous message record contains fields of information such as the originating and terminating telephone numbers, and the length of time of the call. These message records are then transmitted from the switch to a message accumulation system for processing and billing.

Because the message records are stored in electronic format, they can be transmitted from one computer system to another and reformatted to ease processing of the information. Thus the carrier's AMA message subsequently is translated into the industry-standard "exchange message interface," forwarded to a rating system, and ultimately forwarded to a billing system in which the data resides until processed to generate, typically, "hard copy" bills which are mailed to subscribers.

B.

The invention of the '184 patent calls for the addition of a data field into a standard message record to indicate whether a call involves a particular PIC (the "PIC indicator"). This PIC indicator can exist in several forms, such as a code which identifies the call recipient's PIC, a flag which shows that the recipient's PIC is or is not a particular IXC, or a flag that identifies the recipient's and the caller's PICs as the same IXC. The PIC indicator therefore enables IXCs to provide differential billing for calls on the basis of the identified PIC.

The application that issued as the '184 patent was filed in 1992. The U.S. Patent and Trademark Office ("PTO") initially rejected, for reasons unrelated to § 101, all forty-one of the originally filed claims. Following amendment, the claims were issued in 1994 in their present form. The '184 patent contains six independent claims, five method claims and one apparatus claim, and additional dependent claims. The PTO granted the '184 patent without questioning whether the claims were directed to statutory subject matter under § 101.

AT&T in 1996 asserted ten of the method claims against Excel in this infringement suit. The independent claims at issue (claims 1, 12, 18, and 40) include the step of "generating a message record for an interexchange call between an originating subscriber and a terminating subscriber," and the step of adding a PIC indicator to the message record. Independent claim 1, for example, adds a PIC indicator whose value depends upon the call recipient's PIC:

> 1. A method for use in a telecommunications system in which interexchange calls initiated by each subscriber are automatically routed over the facilities of a particular one of a plurality of

> interexchange carriers associated with that subscriber, said method comprising the steps of:
>
> *generating a message record for an interexchange call* between an originating subscriber and a terminating subscriber, and
>
> *including, in said message record, a primary interexchange carrier (PIC) indicator* having a value which is *a function of whether or not the interexchange carrier associated with said terminating subscriber is a predetermined one* of said interexchange carriers.

(Emphasis added.) Independent claims 12 and 40 add a PIC indicator that shows if a recipient's PIC is the same as the IXC over which that particular call is being made. Independent claim 18 adds a PIC indicator designed to show if the caller and the recipient subscribe to the same IXC. The dependent claims at issue add the steps of accessing an IXC's subscriber database (claims 4, 13, and 19) and billing individual calls as a function of the value of the PIC indicator (claims 6, 15, and 21).

The district court concluded that the method claims of the '184 patent implicitly recite a mathematical algorithm. *See AT&T*, 1998 WL 175878, at *6. The court was of the view that the only physical step in the claims involves data-gathering for the algorithm. *See id.* Though the court recognized that the claims require the use of switches and computers, it nevertheless concluded that use of such facilities to perform a non-substantive change in the data's format could not serve to convert non-patentable subject matter into patentable subject matter. *See id.* at *6-7. Thus the trial court, on summary judgment, held all of the method claims at issue invalid for

failure to qualify as statutory subject matter. *See id.* at *7.

DISCUSSION

A.

Summary judgment is appropriate if there are no genuine issues of material fact and the moving party is entitled to judgment as a matter of law. *See* Fed. R. Civ. P. 56(c). We review without deference a trial court's grant of summary judgment, with all justifiable factual inferences drawn in favor of the party opposing the motion. *See Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255 (1986).

The issue on appeal, whether the asserted claims of the '184 patent are invalid for failure to claim statutory subject matter under 35 U.S.C. § 101, is a question of law which we review without deference. *See Arrhythmia Research Tech. v. Corazonix Corp.*, 958 F.2d 1053, 1055-56, 22 USPQ2d 1033, 1035 (Fed. Cir. 1992). In matters of statutory interpretation, it is this court's responsibility independently to determine what the law is. *See Hodges v. Secretary of the Dep't of Health & Human Servs.*, 9 F.3d 958, 960 (Fed. Cir. 1993).

B.

Our analysis of whether a claim is directed to statutory subject matter begins with the language of 35 U.S.C. § 101, which reads:

> Whoever invents or discovers any new and useful process machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The Supreme Court has construed § 101 broadly, noting that Congress intended statutory subject matter to "include anything under the sun that is made by man." *See Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) (quoting S. Rep. No. 82-1979, at 5 (1952); H.R. Rep. No. 82-1923, at 6 (1952)); *see also Diamond v. Diehr*, 450 U.S. 175, 182 (1981). Despite this seemingly limitless expanse, the Court has specifically identified three categories of unpatentable subject matter: "laws of nature, natural phenomena, and abstract ideas." *See Diehr*, 450 U.S. at 185.

In this case, the method claims at issue fall within the "process" [1] category of the four enumerated categories of patentable subject matter in § 101. The district court held that the claims at issue, though otherwise within the terms of § 101, implicitly recite a mathematical algorithm, *see AT&T*, 1998 WL 175878, at *6, and thus fall within the judicially created "mathematical algorithm" exception to statutory subject matter.

A mathematical formula alone, sometimes referred to as a mathematical algorithm, viewed in the abstract, is considered unpatentable subject matter. *See Diamond v. Diehr*, 450 U.S. 175 (1981); *Parker v. Flook*, 437 U.S. 584 (1978); *Gottschalk v. Benson*, 409 U.S. 63 (1972). Courts have used the terms "mathematical algorithm," "mathematical formula," and "mathematical equation," to describe types of nonstatutory mathematical subject matter without explaining whether the terms are interchangeable or different. Even assuming the words connote the same concept, there is considerable question as to exactly what the concept encompasses. *See, e.g., Diehr*, 450 U.S. at 186 n.9 ("The term 'algorithm' is subject to a variety

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[1] "Process" is defined in 35 U.S.C. § 100(b) to encompass: "[a] process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material."

of definitions . . . [Petitioner's] definition is significantly broader than the definition this Court employed in *Benson* and *Flook*."); *accord In re Schrader*, 22 F.3d 290, 293 n.5, 30 USPQ2d 1455, 1457 n.5 (Fed. Cir. 1994).

This court recently pointed out that any step-by-step process, be it electronic, chemical, or mechanical, involves an "algorithm" in the broad sense of the term. *See State Street Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1374-75, 47 USPQ2d 1596, 1602 (Fed. Cir. 1998), *cert. denied*, —— U.S. ——, 119 S. Ct. 851 (1999). Because § 101 includes processes as a category of patentable subject matter, the judicially-defined proscription against patenting of a "mathematical algorithm," to the extent such a proscription still exists, is narrowly limited to mathematical algorithms in the abstract. *See id.; see also Benson*, 409 U.S. at 65 (describing a mathematical algorithm as a "procedure for solving a given type of mathematical problem").

Since the process of manipulation of numbers is a fundamental part of computer technology, we have had to reexamine the rules that govern the patentability of such technology. The sea-changes in both law and technology stand as a testament to the ability of law to adapt to new and innovative concepts, while remaining true to basic principles. In an earlier era, the PTO published guidelines essentially rejecting the notion that computer programs were patentable.[2] As the technology progressed, our predecessor court disagreed, and, overturning some of the earlier limiting principles regarding § 101, announced more expansive principles formulated with computer technology in mind.[3] In our recent decision in *State*

[2] *See, e.g.*, 33 Fed. Reg. 15581, 15609-10 (1968).

[3] *See In re Taczy-Hornoch*, 397 F.2d 856, 158 USPQ 141 (CCPA 1968) (overruling the "function of a machine" doctrine); *see also*

Street, this court discarded the so-called "business method" exception and reassessed the "mathematical algorithm" exception, *see* 149 F.3d at 1373-77, 47 USPQ2d at 1600-04, both judicially-created "exceptions" to the statutory categories of § 101. As this brief review suggests, this court (and its predecessor) has struggled to make our understanding of the scope of § 101 responsive to the needs of the modern world.

The Supreme Court has supported and enhanced this effort. In *Diehr*, the Court expressly limited its two earlier decisions in *Flook* and *Benson* by emphasizing that these cases did no more than confirm the "long-established principle" that laws of nature, natural phenomena, and abstract ideas are excluded from patent protection. 450 U.S. at 185. The *Diehr* Court explicitly distinguished Diehr's process by pointing out that "the respondents here do not seek to patent a mathematical formula. Instead, they seek patent protection for a process of curing synthetic rubber." *Id.* at 187. The Court then explained that although the process used a well-known mathematical equation, the applicants did not "pre-empt the use of that equation." *Id.* Thus, even though a mathematical algorithm is not patentable in isolation, a process that applies an equation to a new and useful end "is at the very least not barred at the threshold by § 101." *Id.* at 188. In this regard, it is particularly worthy of note that the argument for the opposite result, that "the term 'algorithm' . . . is synonymous with the term 'computer program,'" *id.* at 219 (Stevens, J., dissenting), and thus computer-

In re Bernhart, 417 F.2d 1395, 163 USPQ 611 (CCPA 1969) (discussing patentability of a programmed computer); *In re Musgrave*, 431 F.2d 882, 167 USPQ 280 (CCPA 1970) (analyzing process claims encompassing computer programs). For a more detailed review of this history, with extensive citation to the secondary literature, see Justice Stevens's dissent in *Diehr*, 450 U.S. at 193.

based programs as a general proposition should not be patentable, was made forcefully in dissent by Justice Stevens; his view, however, was rejected by the *Diehr* majority.

As previously noted, we most recently addressed the "mathematical algorithm" exception in *State Street*. *See* 149 F.3d at 1373-75, 47 USPQ2d at 1600-02. In *State Street*, this court, following the Supreme Court's guidance in *Diehr*, concluded that "[u]npatentable mathematical algorithms are identifiable by showing they are merely abstract ideas constituting disembodied concepts of truths that are not 'useful.' . . . [T]o be patentable an algorithm must be applied in a 'useful' way." *Id.* at 1373, 47 USPQ2d at 1601. In that case, the claimed data processing system for implementing a financial management structure satisfied the § 101 inquiry because it constituted a "practical application of a mathematical algorithm, . . . [by] produc[ing] 'a useful, concrete and tangible result.'" *Id.* at 1373, 47 USPQ2d at 1601.

The *State Street* formulation, that a mathematical algorithm may be an integral part of patentable subject matter such as a machine or process if the claimed invention as a whole is applied in a "useful" manner, follows the approach taken by this court en banc in *In re Alappat*, 33 F.3d 1526, 31 USPQ2d 1545 (Fed. Cir. 1994). In *Alappat*, we set out our understanding of the Supreme Court's limitations on the patentability of mathematical subject matter and concluded that:

> [The Court] never intended to create an overly broad, fourth category of [mathematical] subject matter excluded from § 101. Rather, at the core of the Court's analysis . . . lies an attempt by the Court to explain a rather straightforward concept, namely, that certain types of mathematical subject matter,

> *standing alone*, represent nothing more than *abstract ideas until reduced to some type of practical application*, and thus that subject matter is not, in and of itself, entitled to patent protection.

Id. at 1543, 31 USPQ2d at 1556-57 (emphasis added). Thus, the *Alappat* inquiry simply requires an examination of the contested claims to see if the claimed subject matter as a whole is a disembodied mathematical concept representing nothing more than a "law of nature" or an "abstract idea," or if the mathematical concept has been reduced to some practical application rendering it "useful." *Id.* at 1544, 31 USPQ2d at 1557. In *Alappat*, we held that more than an abstract idea was claimed because the claimed invention as a whole was directed toward forming a specific machine that produced the useful, concrete, and tangible result of a smooth waveform display. *See id.* at 1544, 31 USPQ2d at 1557.

In both *Alappat* and *State Street*, the claim was for a machine that achieved certain results. In the case before us, because Excel does not own or operate the facilities over which its calls are placed, AT&T did not charge Excel with infringement of its apparatus claims, but limited its infringement charge to the specified method or process claims. Whether stated implicitly or explicitly, we consider the scope of § 101 to be the same regardless of the form—machine or process—in which a particular claim is drafted. *See, e.g., In re Alappat*, 33 F.3d at 1581, 31 USPQ2d at 1589 Rader, J., concurring) ("Judge Rich, with whom I fully concur, reads Alappat's application as claiming a machine. In fact, whether the invention is a process or a machine is irrelevant. The language of the Patent Act itself, as well as Supreme Court rulings, clarifies that Alappat's invention fits comfortably within 35 U.S.C. § 101 whether viewed as a process or a ma-

chine."); *State Street*, 149 F.3d at 1372, 47 USPQ2d at 1600 ("[F]or the purposes of a § 101 analysis, it is of little relevance whether claim 1 is directed to a 'machine' or a 'process,' . . . ."). Furthermore, the Supreme Court's decisions in *Diehr*, *Benson*, and *Flook*, all of which involved method (i.e., process) claims, have provided and supported the principles which we apply to both machine- and process-type claims. Thus, we are comfortable in applying our reasoning in *Alappat* and *State Street* to the method claims at issue in this case.

C.

In light of this review of the current understanding of the "mathematical algorithm" exception, we turn now to the arguments of the parties in support of and in opposition to the trial court's judgment. We note that, at the time the trial court made its decision, that court did not have the benefit of this court's explication in *State Street* of the mathematical algorithm issue.

As previously explained, AT&T's claimed process employs subscribers' and call recipients' PICs as data, applies Boolean algebra to those data to determine the value of the PIC indicator, and applies that value through switching and recording mechanisms to create a signal useful for billing purposes. In *State Street*, we held that the processing system there was patentable subject matter because the system takes data representing discrete dollar amounts through a series of mathematical calculations to determine a final share price—a useful, concrete, and tangible result. *See* 149 F.3d at 1373, 47 USPQ2d at 1601.

In this case, Excel argues, correctly, that the PIC indicator value is derived using a simple mathematical principle (p and q). But that is not determinative because

AT&T does not claim the Boolean principle as such or attempt to forestall its use in any other application. It is clear from the written description of the '184 patent that AT&T is only claiming a process that uses the Boolean principle in order to determine the value of the PIC indicator. The PIC indicator represents information about the call recipient's PIC, a useful, non-abstract result that facilitates differential billing of long-distance calls made by an IXC's subscriber. Because the claimed process applies the Boolean principle to produce a useful, concrete, tangible result without pre-empting other uses of the mathematical principle, on its face the claimed process comfortably falls within the scope of § 101. *See Arrhythmia Research Tech. Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1060, 22 USPQ2d 1033, 1039 (Fed. Cir. 1992) ("That the product is numerical is not a criterion of whether the claim is directed to statutory subject matter.").

Excel argues that method claims containing mathematical algorithms are patentable subject matter only if there is a "physical transformation" or conversion of subject matter from one state into another. The physical transformation language appears in *Diehr*, *see* 450 U.S. at 184 ("That respondents' claims involve the transformation of an article, in this case raw, uncured synthetic rubber, into a different state or thing cannot be disputed."), and has been echoed by this court in *Schrader*, 22 F.3d at 294, 30 USPQ2d at 1458 ("Therefore, we do not find in the claim any kind of data transformation.").

The notion of "physical transformation" can be misunderstood. In the first place, it is not an invariable requirement, but merely one example of how a mathematical algorithm may bring about a useful application. As the Supreme Court itself noted, "when [a claimed invention] is performing a function which the patent laws were

designed to protect (e.g., transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of § 101." *Diehr*, 450 U.S. at 192 (emphasis added). The "e.g." signal denotes an example, not an exclusive requirement.

This understanding of transformation is consistent with our earlier decision in *Arrhythmia*, 958 F.2d 1053, 22 USPQ2d 1033 (Fed. Cir. 1992). Arrhythmia's process claims included various mathematical formulae to analyze electrocardiograph signals to determine a specified heart activity. *See id.* at 1059, 22 USPQ2d at 1037-38. The *Arrhythmia* court reasoned that the method claims qualified as statutory subject matter by noting that the steps transformed physical, electrical signals from one form into another form—a number representing a signal related to the patient's heart activity, a non-abstract output. *See id.*, 22 USPQ2d at 1038. The finding that the claimed process "transformed" data from one "form" to another simply confirmed that Arrhythmia's method claims satisfied § 101 because the mathematical algorithm included within the process was applied to produce a number which had specific meaning—a useful, concrete, tangible result—not a mathematical abstraction. *See id.* at 1060, 22 USPQ2d at 1039.

Excel also contends that because the process claims at issue lack physical limitations set forth in the patent, the claims are not patentable subject matter. This argument reflects a misunderstanding of our case law. The cases cited by Excel for this proposition involved machine claims written in means-plus-function language. *See, e.g., State Street*, 149 F.3d at 1371, 47 USPQ2d at 1599; *Alappat*, 33 F.3d at 1541, 31 USPQ2d at 1554-55. Apparatus claims written in this manner require supporting structure in the written description that corresponds to the claimed "means" elements. *See* 35 U.S.C. § 112,

para. 6 (1994). Since the claims at issue in this case are directed to a process in the first instance, a structural inquiry is unnecessary.

The argument that physical limitations are necessary may also stem from the second part of the *Freeman-Walter-Abele* test,[4] an earlier test which has been used to identify claims thought to involve unpatentable mathematical algorithms. That second part was said to inquire "whether the claim is directed to a mathematical algorithm that is not applied to or limited by physical elements." *Arrhythmia*, 958 F.2d at 1058, 22 USPQ2d at 1037. Although our en banc *Alappat* decision called this test "not an improper analysis," we then pointed out that "the ultimate issue always has been whether the claim as a whole is drawn to statutory subject matter." 33 F.3d at 1543 n.21, 31 USPQ2d at 1557 n.21. Furthermore, our recent *State Street* decision questioned the continuing viability of the *Freeman-Walter-Abele* test, noting that, "[a]fter *Diehr* and *Chakrabarty*, the *Freeman-Walter-Abele* test has little, if any, applicability to determining the presence of statutory subject matter." 149 F.3d at 1374, 47 USPQ2d at 1601. Whatever may be left of the earlier test, if anything, this type of physical limitations analysis seems of little value because "after *Diehr* and *Alappat*, the mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, would not render it nonstatutory subject matter, unless, of course, its operation does not produce a 'useful, concrete and tangible result.'" *Id.* at 1374, 47 USPQ2d at 1602 (quoting *Alappat*, 33 F.3d at 1544, 31 USPQ2d at 1557).

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[4] See *In re Freeman*, 573 F.2d 1237, 197 USPQ 464 (CCPA 1978), as modified by *In re Walter*, 618 F.2d 758, 205 USPQ 397 (CCPA 1980), and *In re Abele*, 648 F.2d 902, 214 USPQ 682 (CCPA 1982).

Because we focus on the inquiry deemed "the ultimate issue" by *Alappat*, rather than on the physical limitations inquiry of the *Freeman-Walter-Abele* test, we find the cases cited by Excel in support of its position to be inapposite. For example, in *In re Grams*, the court applied the *Freeman-Walter-Abele* test and concluded that the only physical step in the claimed process involved data-gathering for the algorithm; thus, the claims were held to be directed to unpatentable subject matter. *See* 888 F.2d 835, 839, 12 USPQ2d 1824, 1829 (Fed. Cir. 1989). In contrast, our inquiry here focuses on whether the mathematical algorithm is applied in a practical manner to produce a useful result. *In re Grams* is unhelpful because the panel in that case did not ascertain if the end result of the claimed process was useful, concrete, and tangible.

Similarly, the court in *In re Schrader* relied upon the *Freeman-Walter-Abele* test for its analysis of the method claim involved. The court found neither a physical transformation nor any physical step in the claimed process aside from the entering of data into a record. *See* 22 F.3d at 294, 30 USPQ2d at 1458. The *Schrader* court likened the data-recording step to that of data-gathering and held that the claim was properly rejected as failing to define patentable subject matter. *See id.* at 294, 296, 30 USPQ2d at 1458-59. The focus of the court in *Schrader* was not on whether the mathematical algorithm was applied in a practical manner since it ended its inquiry before looking to see if a useful, concrete, tangible result ensued. Thus, in light of our recent understanding of the issue, the *Schrader* court's analysis is as unhelpful as that of *In re Grams*.

Finally, the decision in *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994) is not to the contrary. There the court recognized the difficulty in

knowing exactly what a mathematical algorithm is, "which makes rather dicey the determination of whether the claim as a whole is no more than that." *Id.* at 1359, 31 USPQ2d at 1758. Warmerdam's claims 1-4 encompassed a method for controlling the motion of objects and machines to avoid collision with other moving or fixed objects by generating bubble hierarchies through the use of a particular mathematical procedure. *See id.* at 1356, 31 USPQ2d at 1755-56. The court found that the claimed process did nothing more than manipulate basic mathematical constructs and concluded that "taking several abstract ideas and manipulating them together adds nothing to the basic equation"; hence, the court held that the claims were properly rejected under § 101. *Id.* at 1360, 31 USPQ2d at 1759. Whether one agrees with the court's conclusion on the facts, the holding of the case is a straightforward application of the basic principle that mere laws of nature, natural phenomena, and abstract ideas are not within the categories of inventions or discoveries that may be patented under § 101.

D.

In his dissent in *Diehr*, Justice Stevens noted two concerns regarding the § 101 issue, and to which, in his view, federal judges have a duty to respond:

> First, the cases considering the patentability of program-related inventions do not establish rules that enable a conscientious patent lawyer to determine with a fair degree of accuracy which, if any, program-related inventions will be patentable. Second, the inclusion of the ambiguous concept of an "algorithm" within the "law of nature" category of unpatentable subject matter has given rise to the concern that almost any process might be so described and therefore held unpatentable.

Diehr, 450 U.S. at 219 (Stevens, J., dissenting).

Despite the almost twenty years since Justice Stevens wrote, these concerns remain important. His solution was to declare all computer-based programming unpatentable. That has not been the course the law has taken. Rather, it is now clear that computer-based programming constitutes patentable subject matter so long as the basic requirements of § 101 are met. Justice Stevens's concerns can be addressed within that framework.

His first concern, that the rules are not sufficiently clear to enable reasonable prediction of outcomes, should be less of a concern today in light of the refocusing of the § 101 issue that *Alappat* and *State Street* have provided. His second concern, that the ambiguous concept of "algorithm" could be used to make any process unpatentable, can be laid to rest once the focus is understood to be not on whether there is a mathematical algorithm at work, but on whether the algorithm-containing invention, as a whole, produces a tangible, useful, result.

In light of the above, and consistent with the clearer understanding that our more recent cases have provided, we conclude that the district court did not apply the proper analysis to the method claims at issue. Furthermore, had the court applied the proper analysis to the stated claims, the court would have concluded that all the claims asserted fall comfortably within the broad scope of patentable subject matter under § 101. Accordingly, we hold as a matter of law that Excel was not entitled to the grant of summary judgment of invalidity of the '184 patent under § 101.

Since the case must be returned to the trial court for further proceedings, and to avoid any possible misunderstandings as to the scope of our decision, we note that the ultimate validity of these claims depends upon their satisfying the other requirements for patentability such as

those set forth in 35 U.S.C. §§ 102, 103, and 112. Thus, on remand, those questions, as well as any others the parties may properly raise, remain for disposition.

CONCLUSION

The district court's summary judgment of invalidity is reversed, and the case is remanded for further proceedings consistent with this opinion.

REVERSED & REMANDED.

APPENDIX B

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

Civil Action. No. 96-434-SLR

AT&T CORP.,

Plaintiff,

v.

EXCEL COMMUNICATIONS, INC.;
EXCEL COMMUNICATIONS MARKETING, INC.;
and EXCEL TELECOMMUNICATIONS, INC.,

Defendants.

Dated: March 27, 1998
Wilmington, Delaware

MEMORANDUM OPINION

ROBINSON, District Judge

I. INTRODUCTION

Plaintiff AT&T Corp. ("AT&T") instituted suit against defendants Excel Communications, Inc., Excel Communications Marketing, Inc., and Excel Telecommunications, Inc. (collectively referred to as "Excel") alleging that Excel has infringed U.S. Patent No. 5,333,184 ("'184 patent"). This court has subject matter jurisdiction pursuant to 28 U.S.C. § 1338.

Pending before the court is Excel's motion for summary judgment based on Excel's contention that the '184 patent does not meet the requirements of 35 U.S.C. § 101. (D.I. 182) The motion has been fully briefed and argued. For the reasons that follow, the motion shall be granted.

II. BACKGROUND INFORMATION

As recently as 15 years ago, AT&T was the primary provider of telephone services in the United States. Consistent with the final order entered in *United States v. AT&T*, 552 F. Supp. 131 (D.D.C. 1982), *aff'd sub nom, Maryland v. U.S.*, 460 U.S. 1001 (1983), AT&T agreed to divest itself of its local telephone companies, in exchange for retaining its long distance and equipment manufacturing businesses. Consequently, local phone companies (local exchange carriers or "LECs") have been required to offer to all interexchange carriers ("IXCs")[1] access to the local exchange network that is "equal in

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[1] LECs are the telephone companies that provide the physical connection between a subscriber's telephone and the local switching office. These companies provide local telephone service and connect customers to IXC's for handling long-distance calls.

IXCs are either "facilities-based," or "resellers." *See In the Matter of WATS Int'l Corp. v. Group Long Distance (USA), Inc.*, 12 F.C.C.R. 1743, 1744 n.5 (1997). A facilities-based IXC is a carrier that provides telecommunications services from facilities (i.e., switches and transmission lines) which they own, operate, lease or otherwise control. AT&T is a facilities-based IXC.

Excel is a "reseller." Excel does not own, operate, lease, or otherwise control facilities for carrying the interexchange calls of its customers but does provide billing and other customer services. Resellers such as Excel are regulated as common carriers by the FCC even though they do not actually carry the long-distance calls of their customers. *See AT&T v. FCC*, 572 F.2d 17, 24 (2d Cir. 1978) ("A common carrier is one which undertakes indifferently to provide communications service to the public for hire, regardless of the actual ownership or operation of the facilities involved.").

type, quality, and price" to that offered to AT&T and its affiliates. The "equal access" directive not only required that IXCs would receive equal transmission quality, but also that callers would have the opportunity to presubscribe their telephones to an IXC other than AT&T.[2]

By September 1986, LECs were required to develop a mechanism for local phone customers to choose IXCs other than AT&T to be their "primary interexchange carrier" ("PIC"); that is, the carrier that would provide long-distance service for calls dialed from the customers' telephone.[3] Implementation of such "equal access" ensured that when a subscribed made a 1+ long-distance call, the subscriber's LEC would, with some geographic exceptions, direct the call to the network of the subscriber's PIC.

III. THE '184 PATENT

The '184 patent generally "relates to arrangements used in telephone networks for recording messages used to bill charges for interexchange calls." (Col. 1, lns 6-8) The invention is "more particularly" described as relating "to the generation of message records for long-distance—

---

[2] Before the advent of "equal access," all interstate long-distance calls dialed on a 1+ basis were routed by the LEC to AT&T. A caller could reach another IXC only by dialing a seven-digit phone number, as well as a lengthy identification code, prior to dialing the called number. "Equal access" enabled callers to select a carrier other than AT&T to provide them long-distance phone service on a simple "1+" dialing basis. The end user has the additional capability of using other IXCs by "dialing around" the selected IXC. An end user "dials around" a presubscribed carrier by dialing an access code prefix (e.g., 1-800-CALL ATT to reach AT&T or 10333 to reach Sprint) in order to use the long-distance carrier the end user prefers for that call.

[3] *See U.S. v. Western Elec. Co.*, 578 F. Supp. 668, 670 (D.D.C. 1983).

or so-called interexchange—calls, which involve the use of the facilities of a long-distance, or interexchange, carrier, also referred to as an IXC." (Col. 1, lns 30-34) The real-world context for the invention is generally described in the specification as follows:

> Each subscriber to a local telephone service from a local exchange carrier, or LEC . . ., has an associated "primary interexchange carrier," or PIC, that was selected by or for the local subscriber. . . . When a long-distance call is initiated by the subscriber, the call is routed through the network of the originating subscriber's LEC, over the network of the PIC and, ultimately, through the network of the LEC which has as one of its subscribers the called party. At the termination of the call, a switch which carried the call—illustratively a switch in the interexchange carrier's network—generates the AMA [automatic message account]. . . .
>
> (Col. 1, lns 35-49)
>
> In a typical system, the message records . . . are transmitted from an originating switch to a message accumulation system. The latter distributes the accumulated messages to appropriate further processing systems which translate the AMA message records into the industry-standard "exchange message interface," or EMI, message record format. The EMI records are thereupon forwarded to a rating system which, *inter alia*, computes the toll charges applicable to the calls and adds an indication of those charges to the EMI record. The records thus formed are forwarded to a billing system in which they reside until processed to generate, typically, "hard copy" bills which are mailed to subscribers.
>
> (Col. 1, lns 14-29)

The '184 patent specifically involves the addition of "a further piece of data"—the PIC indicator—to the typical message record fields[4] by the rating systems. "Each rating system, in order to generate the PIC indicator, needs to be able to access a comprehensive database in which all [of a certain IXC's] subscriber telephone numbers are stored." (Col. 5, lns 33-36) As noted, the generation of the PIC indicator in the embodiment described in the specification occurs in the rating system:

> In particular, it is first determined at step 506 whether the originating subscriber is PIC'd to IXC 30. If not, there is no need to continue further inasmuch as PIC indicator 3410 will necessarily be in the "not set" state, as shown in FIG. 3. On the other hand, if the originating subscriber is PIC'd to IXC 30, then it is determined at step 508 whether the terminating subscriber is PIC's to IXC 30. If the terminating subscriber is not PIC's to IXC 30, then, again, PIC indicator 3419 will be left in the "not set" state. If, however, the terminating subscriber is PIC's to IXC 30, then PIC indictaor 3419 will be put in the "set" state, as indicated at step 511. After perhaps performing various other functions not relevant here, rating system 331 transfers, or transmits, the now rated and PIC-evaluated EMI message to a billing system for subsequent processing.

(Col. 5, lns 45-61)

> The value of PIC indicator 3419 . . . is an indication as to whether the PIC of the terminating subscriber of the call in question is IXC 30. In various

---

4 The "[t]ypical message record fields are the originating and terminating telephone numbers and elapsed time of call." (Col. 1, lns 12-14)

> embodiments, this indication may take the form of a code which actually identifies the terminating subscriber's PIC. Or the PIC indicator may simply be in the form of a flag, or indicator, which indicates, at a minimum, whether or not the terminating subscriber's PIC is IXC 30. In the present illustrative embodiment, however, PIC indicator 3419 is even more explicit than that. In particular, its value indicates whether or not both the terminating and originating subscribers' PIC is IXC 30.

(Col. 4, lns 11-22)

In summary then, the crux of the invention is to include a "PIC indicator" on the standard EMI message record. As explained above, a "PIC" is the "primary interexchange carrier" selected by or for a local subscriber; when said subscriber initiates a long-distance call, that call will be routed over the network of that subscriber's PIC by the LEC absent some further intervention by the subscriber. (Col. 1, lns 35-45) A "PIC indicator" is some indication of whether the terminating subscriber's PIC is the same as the originating subscriber's PIC, information which traditionally has not been relevant to the question of whether and to what extent the originating subscriber should be charged for a long-distance call. In accordance with the '184 patent, the "PIC indicator"

> may be used by an interexchange carrier when bills are rendered for its subscribers—for example, to provide different billing treatment for calls that were made over that carrier's network to terminating subscribers whose PIC is, in fact, that very carrier, as opposed to calls that were made to subscribers with a different PIC.

(Col. 1, ln 67-Col. 2, ln 5)

The four independent claims asserted by AT&T against Excel read as follows:

1. A method for use in a telecommunications system in which interexchange calls initiated by each subscriber are automatically routed over the facilities of a particular one of a plurality of interexchange carriers associated with that subscriber, said method comprising the steps of:

generating a message record for an interexchange call between an originating subscriber and a terminating subscriber, and

including, in said message record, a primary interexchange carrier (PIC) indicator having a value which is a function of whether or not the interexchange carrier associated with said terminating subscriber is a predetermined one of said interexchange carriers.

* * *

12. A method for use in a telecommunications system in which each subscriber has a primary interexchange carrier (PIC) over which interexchange calls initiated by that subscriber are carried, said method comprising the steps of:

generating a message record for each interexchange call between an originating subscriber and a terminating subscriber for which a charge is to be imposed, and

providing, in said message record, an indication which has a particular value when the particular interexchange carrier over which said call was carried is the PIC for said terminating subscriber.

* * *

18. A method for use in a telecommunications system in which each subscriber has a primary interexchange carrier (PIC) over which interexchange calls initiated by that subscriber are carried, said method comprising the steps of:

generating a message record for each interexchange call between an originating subscriber and a terminating subscriber for which a charge is to be imposed, and

providing, in said message record, an indication which has a particular value when the particular interexchange carrier over which said call was carried is the PIC for said terminating subscriber and is also the PIC for said originating subscriber.

* * *

40. A method for use in a telecommunications system in which interexchange calls initiated by each subscriber are automatically routed over the facilities of a particular one of a plurality of interexchange carriers associated with that subscriber, said method comprising the steps of:

generating a message record for an interexchange call between an originating subscriber and a terminating subscriber,

accessing a database in which are stored the telephone numbers of substantially all of the subscribers associated with the specific one of said interexchange carriers over which said call was routed to make determination as to whether or not the interexchange carrier associated with said terminating subscriber is said specific interexchange carrier over whose facilities said call was routed,

establishing an indicator for said call at a particular value when said determination is that the inter-

exchange carrier associated with said terminating subscriber is said specific interexchange carrier over whose facilities said call was routed, and

providing an output which is a function of both information in said message record and of said indicator.

(Col. 7, lns 2-16; Col. 8, lns 15-27 and 57-68; Col. 9, lns 1-2; Col. 12, lns 1-24)

IV. STANDARD OF REVIEW

Summary judgment should be granted only if a court concludes that "there is no genuine issue as to any material fact and that the moving party is entitled to judgment as a matter of law." Fed.R.Civ.P. 56(c). The moving party bears the burden of proving that no genuine issue of material fact is in dispute. *See Matsushita Elec. Indus. Co., Ltd. v. Zenith Radio Corp.*, 475 U.S. 574, 586 n.10 (1986). Once the movant has carried its initial burden, "the nonmoving party must come forward with 'specific facts showing that there is a genuine issue for trial.'" *Id.* at 587 (citation omitted). "Facts that could alter the outcome are 'material,' and disputes are 'genuine' if evidence exists from which a rational person could conclude that the position of the person with the burden of proof on the disputed issue is correct." *Horowitz v. Federal Kemper Life Assurance Co.*, 57 F.3d 300, 302 n.1 (3d Cir. 1995) (citations omitted). This court must "view the underlying facts and all reasonable inferences therefrom in the light most favorable to the party opposing the motion." *Pennsylvania Coal Ass'n v. Babbitt*, 63 F.3d 231, 236 (3d Cir. 1995) (citation omitted).

There are no disputed facts material to the issue at bar. Moreover, the question of whether the claims asserted by AT&T are directed to statutory subject matter, as defined

in 35 U.S.C. § 101, is one of law. *See Arrhythmia Research Technology, Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1055 (Fed. Cir. 1992). Therefore, summary judgment is an appropriate mechanism to resolve the § 101 challenge, keeping in mind the statutory presumption of validity in a patent case. *See id.*

V. ANALYSIS

Patentable subject matter is defined in 35 U.S.C. § 101 as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

As an initial matter, the Supreme Court has observed "that Congress intended statutory subject matter to 'include anything under the sun that is made by man.'" *Diamond v. Diehr*, 450 U.S. 175, 182 (1981) (citation omitted). Thus, "[e]xcluded from such patent protection are laws of nature, natural phenomena, and abstract ideas." *Id.* at 183. Examples of the latter have been described in *Gottschalk v. Benson*, 409 U.S. 63 (1972) and *Parker v. Flook*, 437 U.S. 584 (1978). In *Gottschalk*, the Supreme Court held unpatentable claims for an algorithm (or mathematical formula) used in connection with the programming of a general purpose digital computer. The algorithm at issue converted binary code decimal numbers to equivalent pure binary numbers; the Court concluded that such an algorithm was like a law of nature. Similarly, in *Parker*, the Supreme Court concluded that claims were unpatentable when they did no more than provide a formula for computing a number (in this case, an "alarm limit"), without explaining how the several variables identified in the formula were to be determined and

without any disclosure relating to the chemical processes at work.

The Supreme Court has cautioned in this regard, however, "that a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer." *Diehr*, 450 U.S. at 186. Where, as here, process claims are at issue, "[t]ransformation and reduction of an article 'to a different state or thing' is the clue to . . . patentability. . . ." *Id.* at 183. In *Diehr*, the Court held patentable claims which described "in detail a step-by-step method" for transforming an article—raw, uncured synthetic rubber—into a different state or thing—cured precision products. The Court's conclusion was not altered by the fact that in several steps of the process a mathematical equation and a programmed digital computer were used.

The Federal Circuit, in decisions following *Diehr*, has found patentable "a method of analyzing electrocardiograph signals in order to determine a specified heart activity," *Arrhythmia Research Technology, Inc.*, 958 F.2d at 1058, as well as "a combination of interrelated elements which combine to form a machine for converting discrete waveform data samples into anti-aliased pixel illumination intensity data to be displayed on a display means," *In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994). Found to be unpatentable have been "a method of testing a complex system to determine whether the system condition is normal or abnormal and, if it is abnormal, to determine the cause of the abnormality," *In re Grams*, 888 F.2d 835, 836 (Fed. Cir. 1989); "a method for competitively bidding on a plurality of related items, such as contiguous tracts of land or the like," *In re Schrader*, 22 F.3d 290, 291 (Fed. Cir. 1994); and "methods for generating a 'data structure'" in order to

control the motion of objects and machines to avoid collision with other moving or fixed objects, *In re Warmerdam*, 33 F.3d 1354, 1355 (Fed. Cir. 1994).

Among its various attempts to articulate the test for § 101 patentability, the Federal Circuit in *In re Schrader* stated that "[t]he dispositive issue" in reviewing patentability under § 101 "is whether the claim as a whole recites sufficient physical activity to constitute patentable subject matter." 22 F.3d at 294 n.9 (citing *In re Grams*, 888 F.2d at 839). The Federal Circuit elsewhere has articulated the issue as being whether "the claimed subject matter as a whole is a disembodied mathematical concept, . . . which in essence represents nothing more than a 'law of nature,' 'natural phenomenon,' or 'abstract idea.'"[5] *In re Alappat*, 33 F.3d at 1544; *see, e.g., Arrhythmia Research Technology, Inc.*, 958 F.2d at 1059 ("The tresultant output is not an abstract number, but is a signal related to the patient's heart activity."). In addition, the Federal Circuit has looked to whether the mathematical formula or algorithm was "incorporated in a useful process," *Arrhythmia Research Technology, Inc.*, 958 F.2d at 1057 (commenting on the Supreme Court's ruling in *Diehr*). Consistent with the latter approach, Judge Newman wrote in her dissent in *In re Schrader*, 22 F.3d at 296:

> All mathematical algorithms transform data, and thus serve as a process to convert initial conditions or inputs into solutions or outputs, through transformation of information. Data representing bid prices for parcels of land do not differ, in section

[5] The Federal Circuit in *In re Alappat* defined an abstract idea as constituting "disembodied concepts or truths which are not 'useful' from a practical standpoint standing alone, i.e., they are not 'useful' until reduced to some practical application." 33 F.3. at 1543 n.18.

> 101 substance, from data representing electrocardiogram signals (*Arrhythmia*) or parameters in a process for curing rubber (*Diehr*). All of these processes are employed in technologically useful arts. Even were a mathematical formula viewed as "like a law of nature," . . . the requirements of section 101 are met when the formula is applied in a technological process to produce a useful result.

Despite AT&T's arguments to the contrary, the court finds that the claims at issue implicitly recite a mathematical algorithm. As defined in the '184 patent, the value of the PIC indicator "is a function of whether or not the interexchange carrier associated with [] the terminating subscriber is a predetermined one of said interchange carriers." (Col. 7, lns 13-16) (emphasis added). The fact that the PIC indicator may take the form of a code or a flag does not mandate a finding that the PIC indicator is not "calculated." An algorithm need not involve numbers; it need only specify "a conditional sequence of steps or operations for solving a class of problems." *In re Schrader*, 22 F.2d at 293 n.5..

The independent claims 1, 12, 18, and 40 of the '184 patent claim a method comprising the steps of "generating a message record" and "including, in said message record," a PIC indicator having a value. Although the first element of these claims, generating a message record, is not "new"[6] but a standard practice in the industry, the court is directed to look at the claims as a whole to determine whether the process claimed "is performing a function which the patent laws were designed to protect (e.g., transforming, or reducing an article to a different state or thing). . .. ." *Diehr*, 450 U.S. at 192.

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[6] Of course, novelty is the subject for a § 102 challenge, not a § 101 challenge.. *See Diehr*, 450 U.S. at 189-190.

In this regard, the '184 patent can be described as claiming an invention whereby certain information that is already known within a telecommunications system (the PICs of the originating and terminating subscribers) is simply retrieved for an allegedly new use in billing.[7] Characterized as such, the § 101 inquiry employed, e.g., in *In re Grams*, would dictate a finding of nonpatentability: Where "the only physical step [in the claim] involves merely gathering data for the alborithm," the subject matter is unpatentable. 888 F.2d at 839.

On the other hand, the '184 patent clearly involves the use of "facilities"—e.g., switches and computers—which presumably function (although nowhere in the '184 patent is their function specifically described) to transform analog signals into digital signals for ultimate use in a computerized billing system.[8] The question this scenario raises for the court is whether the routine conversion of data from an analog to a digital format is sufficient for § 101 purposes, when the substantive data remains the same.[9] In other words, which is more important in this § 101 inquiry, form or substance?

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[7] The court understands AT&T to argue in this litigation that the claims are not limited to billing purposes. However, the preferred, and it appears the only practical, embodiment of the claimed method is so directed and is appropriately considered in this § 101 inquiry. *Cf. In re Warmerdam*, 33 F.3d at 1360 and n.4.

[8] AT&T's argument in support of subject matter patentability is grounded primarily on its assertion that

> [t]he invention is not an abstract mathematical exercise or algorithm, but rather is a specific application of specifically tailored hardware and software in a specifically defined environment to accomplish a tangible result.

(D.I. 214 at 5; *see also* D.I. 271 at 40-46)

[9] Although the value of the PIC indicator may differ, depending on what information the IXC wants to know, the actual underlying data—the PICs of the originating and terminating subscribers—

The court concludes that substance has been and should be the focus of the § 101 inquiry.[10] Consequently, if the initial "condition or input" is substantively no different from the "solution or output," a change in the data's format should not serve to convert nonpatentable subject matter into patentable subject matter. Accordingly, the court holds that the claims at issue in the '184 patent are unpatentable under 35 U.S.C. § 101.

VI. CONCLUSION

For the reasons stated, defendants' motion for summary judgment under 35 U.S.C. § 101 (D.I. 182) shall be granted.

An order will follow.

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are known variables which, for purposes of the '184 patent, do not change.

10 This conclusion finds support in the case law identified *supra*. For example, in both *In re Grams*, 888 F.2d at 837, and *In re Schrader*, 22 F.3d at 291, where the data input (test results and winning bids, respectively) was never changed, only compared and/or organized, the Federal Circuit found the subject matter of the proposed inventions nonpatentable. By contrast, in *Arrhythmia Research Technology, Inc.*, 958 F.2d at 1055, and *In re Alappat*, 33 F.3d at 1537, the data input was improved (i.e., changed substantively) through the use of the proposed inventions, "by eliminating certain perturbations that obscured" the inputted electrocardiographic signals (*Arrhythmia Research Technology, Inc.*, 958 F.2d at 1035.) or by "overcom[ing] effects" "known as aliasing" (*In re Alappat*, 33 F.3d at 1537.).

APPENDIX C

UNITED STATES DISTRICT COURT FOR THE DISTRICT OF DELAWARE

Civil Action. No. 96-434-SLR

AT&T CORP.,

Plaintiff,

v.

EXCEL COMMUNICATIONS, INC.;
EXCEL COMMUNICATIONS MARKETING, INC.;
and EXCEL TELECOMMUNICATIONS, INC.,

Defendants.

ORDER

At Wilmington this 27th day of March, 1998, for the reasons stated in the memorandum opinion issued this same date;

IT IS ORDERED that the motion for summary judgment under 35 U.S.C. § 101 filed by defendants Excel Communications, Inc., Excel Communications Marketing, Inc., and Excel Telecommunications, Inc. (D.I. 182) is granted.

IT IS FURTHER ORDERED that the Clerk is directed to enter judgment in favor of defendants Excel Communications, Inc., Excel Communications Marketing, Inc., and Excel Telecommunications, Inc. and against plaintiff AT&T Corp.

/s/ Sue L. Robinson
United States District Judge

APPENDIX D

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

Civil Action No. 96-434 SLR

AT&T CORP.,

Plaintiff,

v.

EXCEL COMMUNICATIONS, INC.;
EXCEL COMMUNICATIONS MARKETING, INC.;
and EXCEL TELECOMMUNICATIONS, INC.,

Defendants.

JUDGMENT IN A CIVIL CASE

For reasons stated in the Memorandum Opinion issued on March 27, 1998, defendants motion for summary judgment (D.I. 182) is granted.

IT IS ORDERED AND ADJUDGED that judgment be and is hereby entered in favor of defendants EXCEL COMMUNICATIONS, INC., EXCEL COMMUNICATIONS MARKETING INC. and EXCEL TELECOMMUNICATIONS, INC.

/s/ Sue L. Robinson
United States District Judge

/s/ Lisa C. Friedkin
(By) Deputy Clerk

Dated: April 1, 1998

No. ——

In The Supreme Court of the United States

EXCEL COMMUNICATIONS, INC.,
EXCEL COMMUNICATIONS MARKETING, INC.,
AND EXCEL TELECOMMUNICATIONS, INC.,
Petitioners,

v.

AT&T CORP.,
Respondent.

Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

PATENT DOCUMENT APPENDIX

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July 13, 1999

13 pp

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US005333184A

United States Patent [19]

Doherty et al.

[11] **Patent Number: 5,333,184**

[45] **Date of Patent: Jul. 26, 1994**

[54] **CALL MESSAGE RECORDING FOR TELEPHONE SYSTEMS**

[75] Inventors: **Gerard P. Doherty**, Yardley, Pa.; **Nicholas J. Lanzillotti**, White House Station; **Conrad J. Paulus**, Bridgewater, both of N.J.

[73] Assignee: **AT&T Bell Laboratories**, Murray Hill, N.J.

[21] Appl. No.: **879,669**

[22] Filed: **May 6, 1992**

[51] Int. Cl.[5] **H04M 15/00**; H04M 7/00; H04M 3/00

[52] U.S. Cl. **379/115**; 379/113; 379/126; 379/229; 379/230; 379/243

[58] Field of Search 379/113, 115, 128, 121, 379/126, 127, 140, 229, 230, 243

[56] **References Cited**

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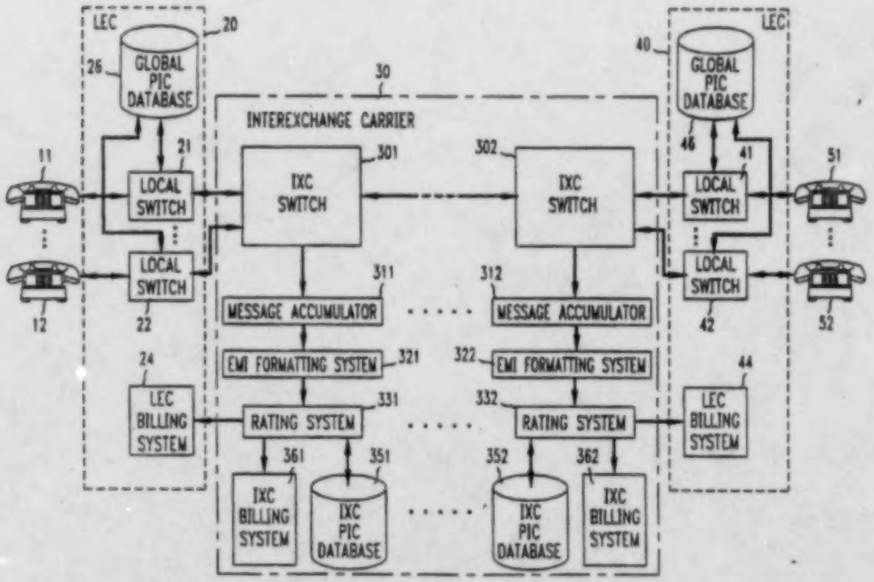
Primary Examiner—Stephen Chin
Assistant Examiner—Vijay Shankar
Attorney, Agent, or Firm—Ronald D. Slusky

[57] **ABSTRACT**

The standard exchange message interface (EMI) message record generated for interexchange telephone toll calls is enhanced via the addition of a primary interexchange carrier (PIC) indicator, whose value provides an indication as to whether a terminating subscriber has a particular interexchange carrier as his/her PIC. The PIC indicator may be used by the interexchange carrier when bills are rendered for its subscribers—for example, to provide different billing treatment for calls that were made over that carrier's network to terminating subscribers whose PIC is, in fact, that very carrier, as opposed to calls that were made to subscribers with a different PIC.

41 Claims, 5 Drawing Sheets



11
12
20
LEC
GLOBAL PIC DATABASE
26
LOCAL SWITCH
21
LOCAL SWITCH
22
LEC BILLING SYSTEM
24
30
INTEREXCHANGE CARRIER
301
IXC SWITCH
311
MESSAGE ACCUMULATOR
321
EMI FORMATTING SYSTEM
331
RATING SYSTEM
361
IXC BILLING SYSTEM
351
IXC PIC DATABASE
51
52
40
LEC
GLOBAL PIC DATABASE
46
41
LOCAL SWITCH
42
LOCAL SWITCH
44
LEC BILLING SYSTEM
302
IXC SWITCH
312
MESSAGE ACCUMULATOR
322
EMI FORMATTING SYSTEM
332
RATING SYSTEM
362
IXC BILLING SYSTEM
352
IXC PIC DATABASE

FIG. 1

FIG. 2

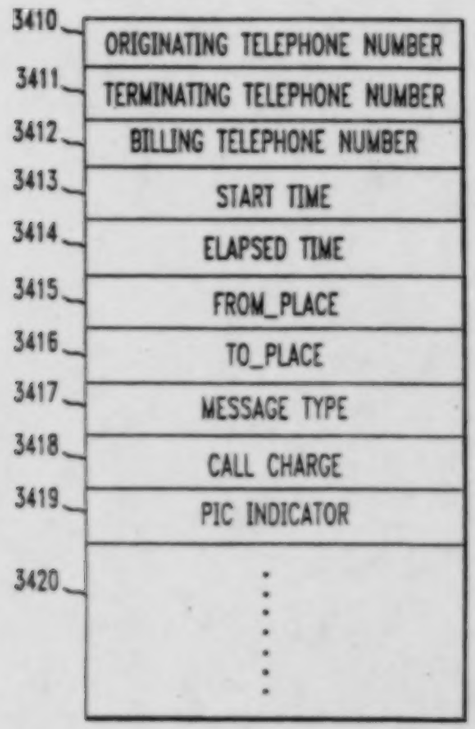


FIG. 3

TERMINATING SUBSCRIBER PIC'D TO CARRIER 30?	ORIGINATING SUBSCRIBER PIC'D TO CARRIER 30? YES	ORIGINATING SUBSCRIBER PIC'D TO CARRIER 30? NO
YES	SET	NOT SET
NO	NOT SET	NOT SET

FIG. 4

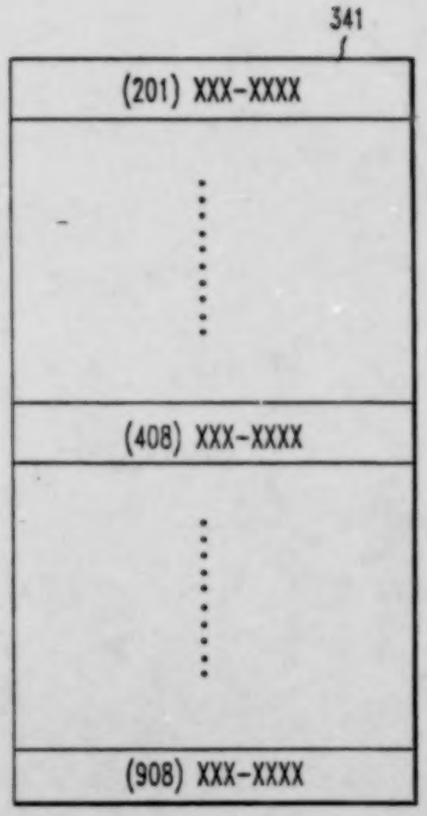


FIG. 5

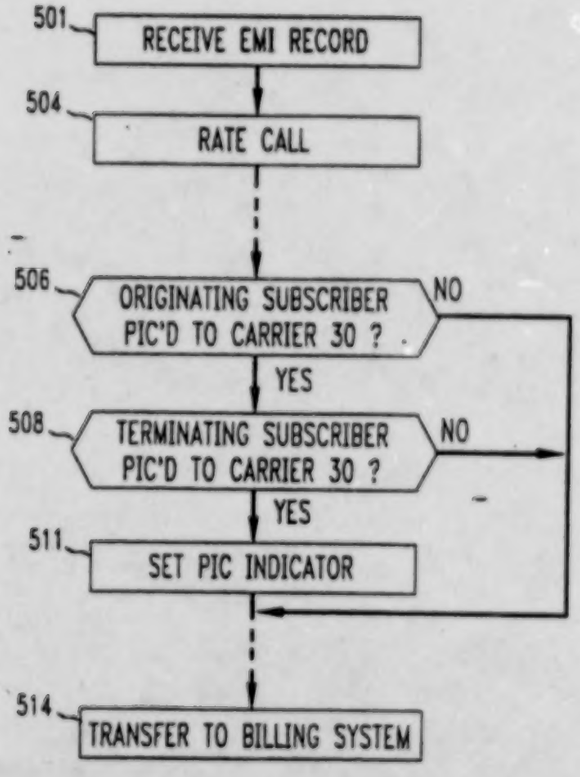

501
RECEIVE EMI RECORD
504
RATE CALL
506
ORIGINATING SUBSCRIBER PIC'D TO CARRIER 30 ?
NO
YES
508
TERMINATING SUBSCRIBER PIC'D TO CARRIER 30 ?
NO
YES
511
SET PIC INDICATOR
514
TRANSFER TO BILLING SYSTEM

FIG. 6

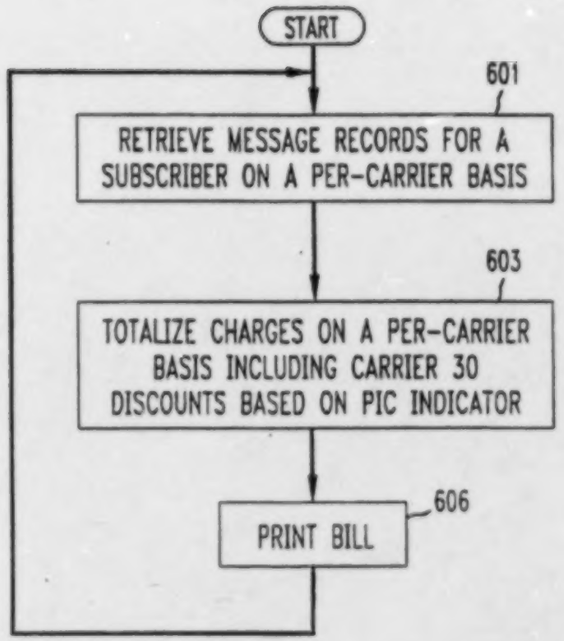
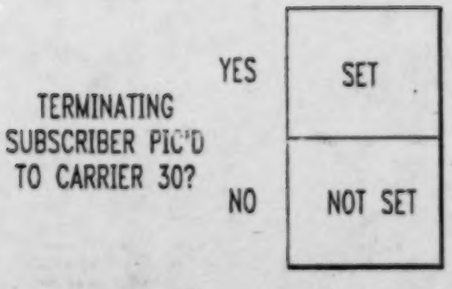

START
601
RETRIEVE MESSAGE RECORDS FOR A SUBSCRIBER ON A PER-CARRIER BASIS
603
TOTALIZE CHARGES ON A PER-CARRIER BASIS INCLUDING CARRIER 30 DISCOUNTS BASED ON PIC INDICATOR
606
PRINT BILL

FIG. 7


TERMINATING SUBSCRIBER PIC'D TO CARRIER 30?
YES
SET
NO
NOT SET

CALL MESSAGE RECORDING FOR TELEPHONE SYSTEMS

BACKGROUND OF THE INVENTION

The present invention relates to arrangements used in telephone networks for recording messages used to bill charges for interexchange calls.

Such arrangements operate by recording the relevant billing data for each toll call, or connection, in a so-called automatic message account, or AMA, message record. Typical message record fields are the originating and terminating telephone numbers and elapsed time of call. In a typical system, the message records, which are created for each call at a time substantially contemporaneous with the termination of the call, are transmitted from an originating switch to a message accumulation system. The latter distributes the accumulated messages to appropriate further processing systems which translate the AMA message records into the industry-standard "exchange message interface," or EMI, message record format. The EMI records are thereupon forwarded to a rating system which, inter alia, computes the toll charges applicable to the calls and adds an indication of those charges to the EMI record. The records thus formed are forwarded to a billing system in which they reside until processed to generate, typically, "hard copy" bills which are mailed to subscribers.

The invention more particularly relates to the generation of message records for long-distance—or so-called interexchange—calls, which involve the use of the facilities of a long-distance, or interexchange, carrier, also referred to as an IXC. In the United States, for example, AT&T, MCI and Sprint are three such IXCs. Each subscriber to local telephone service from a local exchange carrier, or LEC, such as New Jersey Bell, has an associated "primary interexchange carrier," or PIC, that was selected by or for the local subscriber. The local subscriber is said to be "PIC'd" to the associated IXC. When a long-distance call is initiated by the subscriber, the call is routed through the network of the originating subscriber's LEC, over the network of the PIC and, ultimately, through the network of the LEC which has as one of its subscribers the called party. At the termination of the call, a switch which carried the call—illustratively, a switch in the interexchange carrier's network—generates the AMA record as described above.

SUMMARY OF THE INVENTION

In accordance with the invention, it has been recognized that it may be advantageous for a message record to include a further piece of data, referred to herein as the "PIC indicator." The value of the PIG indicator is an indication as to whether the terminating subscriber has a particular interexchange carrier as his/her PIC. The PIC indicator may, for example, take the form of a code which actually identifies the terminating subscriber's PIC. Or it may be in the form of a flag, or indicator, which indicates, at a minimum, that the terminating subscriber's PIC is or is not a particular interexchange carrier or that, more specifically, the PIC for both the terminating and originating subscribers is a particular interexchange carrier.

In accordance with a feature of the invention, the PIC indicator may be used by an interexchange carrier when bills are rendered for its subscribers—for example, to provide different billing treatment for calls that were made over that carrier's network to terminating subscribers whose PIC is, in fact, that very carrier, as opposed to calls that were made to subscribers with a different PIC. This may be contrasted with a different approach used by at least one IXC within the United States wherein a different billing treatment is given to a subscriber of that IXC for calls made to a limited set of pre-identified subscribers who are also PIC'd to that IXC. That prior art approach does not embody the use of a PIC indicator in the call message record, as in the present invention. Rather, it relies on standard data processing techniques implemented at the time the monthly bill is generated to compare each called telephone number with the list of telephone numbers of the pre-identified subscribers.

In accordance with a further feature of the invention, the PIC indicator is advantageously added to the message record in the same system that performs the call rating—and at a time substantially contemporaneous with the rating itself—illustratively using a comprehensive database in which are stored the telephone numbers of all PIC subscribers of the interexchange carrier in question.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 illustrates an interconnection of local exchange carriers and an interexchange carrier embodying the principles of the invention;

FIG. 2 is a conceptual representation of an EMI record created by the interexchange carder;

FIG. 3 is a truth table illustrating the logic controlling the value of a PIC indicator included within the EMI record, in accordance with one embodiment of the invention;

FIG. 4 is a conceptual representation of a database used in implementing the invention;

FIG. 5 is a flowchart of processing performed by a rating system within the interexchange carrier, including the generation of the PIC indicator, and

FIG. 6 is a simplified flowchart of processing performed in rendering printed bills for subscribers of one of the local exchange carriers; and

FIG. 7 is a truth table illustrating the logic controlling the value of a PIC indicator within the EMI record, in accordance with a second embodiment of the invention.

DETAILED DESCRIPTION

In FIG. 1, a plurality of telephone subscribers 11 . . . 12 are provided with local exchange service by a local exchange carrier (LEC) 20. LEC 20 includes a plurality of local central office switches 21 . . . 22 which serve respective ones of the subscribers. When a long-distance call is initiated by a calling, or originating, one of the subscribers, say subscriber 11, the associated local switch 21 recognizes from the dialed telephone number—specifically the area code thereof—that this is, indeed, a long-distance call. As a pan of the processing of this call, switch 21 accesses a database 26 in which is stored an identification of the primary interexchange carrier, or PIC, for each of the LEC's subscribers. Inasmuch as database 26 has PIC information relating to all the interexchange carriers, or IXCs, to which it has access, the database is referred to herein as the "global" PIC database.

In this example, subscriber **11** is PIC'd to IXC **30**. That is, IXC **30** is that subscriber's selected primary interexchange carrier. IXC **30** includes a network of interexchange carrier switches which are illustratively AT&T 4ESS TM and 5ESS ® switches. The call is routed by local switch **21** to IXC **30** and, more particularly, to originating switch **301** therein. Within the network, the call is ultimately routed to IXC terminating switch **302**. In being carried over the network, the call may have also been directed, for example, across various trunks and through various switching nodes (not shown), as is well known in the art.

Also shown in FIG. **1** is a LEC **40** which has as one of its subscribers the party to which the call in question is being directed. Similar to LEC **20**, LEC **40** includes local switches **41** . . . **42** which serve respective LEC subscribers **51** . . . **52**, as well as a global PIC database **46**, which is used when outgoing long distance calls are made by subscribers **51** . . . **52**. In this example, the terminating subscriber is subscriber **51**. Accordingly, IXC carrier terminating switch **302** routes the call to local switch **41** which, in turn, passes the call to its connected subscriber **51**. A connection between subscribers **11** and **51** is thus made, the connection including both LECs and the IXC.

At the completion of the call, IXC originating switch **301** generates the aforementioned AMA record for the call (connection). This switch is periodically polled, along with other like switches, by an associated one of message accumulator systems **311** . . . **312**. In this example it is message accumulator system **311**. Indeed, the principal function of each one of systems **311** . . . **312** is the accumulation of AMA records from the various switches that it serves.

On a periodic basis, on the order of several times a day, each message accumulator sends its accumulated AMA records to a corresponding one of EMI formatting systems **321** . . . **322**. In this case, it is system **321**. The latter translates the AMA records into the aforementioned industry-standard EMI message record format. The EMI records are thereupon periodically forwarded—again, on the order of several times a day—to a respective one of rating systems **331** . . . **332**. In this case it is system **331**. Among the functions of rating systems **331** . . . **332** is to "rate" each call, by which is meant the computation of the standard toll charges or rated charge, applicable to each call, and to add an indication of same to the EMI record.

FIG. **2** is a conceptual representation of an EMI record, some of the fields of which are completed by the EMI formatting systems and others of which are completed by the rating systems. (Other fields may be completed by yet other systems which process the EMI record.) The fields are shown, for pedagogic convenience, in an order that is different from that actually specified by the EMI standard, as will be appreciated by those skilled in the art.

As shown in FIG. **2**, some of the more significant fields of the EMI record are the originating telephone number **3410** (i.e., the telephone number of subscriber **11**); the terminating telephone number **3411** (i.e., the telephone number of subscriber **51**); the billing telephone number **3412**, which is typically the same as the originating telephone number but may be some other number as, for example, when a telephone calling card is used to pay for the call; the start time for the call **3413**; the elapsed time **3414**; the geographic call origination and termination points, e.g. Highland Park, N.J. and San Francisco, Calif., denoted as FROM_PLACE **3415** and TO_PLACE **3416**; message type **3417**, which indicates that the call was, for example, a direct-dialed domestic call, an operator-assisted international call, etc; call charge **3418**, which is the standard dollar charge for the call computed as a function of various ones of the message characteristics recorded in the EMI message such as described above; PIC indicator **3419**, in accordance with the invention; and various other data fields denoted at **3420**.

The value of PIC indicator **3419**, in particular, is an indication as to whether the PIC of the terminating subscriber of the call in question is IXC **30**. In various embodiments, this indication may take the form of a code which actually identifies the terminating subscriber's PIC. Or the PIC indicator may simply be in the form of a flag, or indicator, which indicates, at a minimum, whether or not the terminating subscriber's PIC is IXC **30**. In the present illustrative embodiment, however, PIC indicator **3419** is even more explicit than that. In particular, its value indicates whether or not both the terminating and originating subscribers' PIC is IXC **30**.

It may be noted at this point that it is possible for a call to be routed by LEC **20** to IXC **30** even if the originating subscriber is not PIC'd to IXC **30**. For example, a subscriber PIC'd to another IXC can instruct LEC **20** to route the call via IXC **30** by prefixing the called telephone number by an access code that identifies IXC **30**.

A truth table illustrating the logic which controls the value of the PIC indicator is shown in FIG. **3**. If both of the subscribers are PIC'd to IXC **30**, then PIC indicator **3419** is set. Otherwise it is not set. Certainly, then, as noted above, the value of PIC indicator **3419** does indicate whether or not the PIC of the terminating subscriber is or is not IXC **30**. Specifically, if PIC indicator **3419** is set, then IXC **30** is the terminating subscriber's PIC. If it is not set, then IXC **30** is not the terminating subscriber's PIC.

In this embodiment, the PIC indicator is illustratively provided in the standard EMI field known as the Indicator **25** field, which is dedicated to IXC-specific information.

Advantageously, the value of PIC indicator **3419** can be used in subsequent billing operations (described below). For example, different billing treatments, e.g., discounts, might be provided for subscribers whose PIC is IXC **30**, the discounts being determined as a function of the presence of a set PIC indicator in the various message records that are assembled to create that portion of the subsriber's overall monthly telephone bill that sets forth the charges for calls made over the network of IXC **30**. In the present illustrative embodiment, IXC **30** wishes to give a discount for a call only if both the originating and terminating subscribers are PIC'd to IXC **30**. The fact that an originating subscriber not PIC'd to IXC **30** may have chosen to use IXC **30** for a particular call by, for example, using the aforementioned access code, is illustratively not sufficient for IXC **30** to provide the aforementioned discount treatment. Hence the generation of PIC indicator **3419** in the manner described above. In other embodiments, an IXC may deem it sufficient for purposes of providing the discount that that IXC was the carrier that handled a call, as long as the terminating subscriber is PIC'd to the IXC. In such an embodiment, the PIC indicator would need not incorporate information about the originating subscribers' PICs. It would only need to incorporate

information about the terminating subscribers' PICs. A truth table illustrating the logic which would control the value of the PIC indicator in that case is shown in FIG. 7.

As shown in FIG. 1, IXC 30 further includes IXC PIC databases 351 . . . 352, which are accessed by respective ones of rating systems 331 . . . 332 in the process of generating the PIC indicators. These databases are replicas of one another, i.e., all contain the same information. Illustratively, that information is nothing more than a list of all, or at least substantially all, of the telephone numbers of subscribers of any LEC who are PIC'd to IXC 30. The database contents are represented conceptually in FIG. 4. As shown in FIG. 1, rating system 331 accesses database 351. In particular, it is possible that rating system 331 will use database 351 for determining whether IXC 30 is the PIC of both the originating and terminating telephone numbers. However, in this embodiment, rating system 331 has access to an independent, much smaller database (not shown) in which are stored all of the telephone numbers of subscribers whose message records are routinely processed by system 331 (as opposed to one of the other rating systems), all such subscribers necessarily having IXC 30 as their PIC. Thus rating system 331 can use this smaller database for purposes of determining whether the PIC of the originating number is IXC 30. On the other hand, the message records of various terminating subscribers are processed by various ones of the rating systems 331 . . . 332, depending on the location of those subscribers. For example, message records for subscriber 51 are processed by rating system 332. Therefore, each rating system, in order to generate the PIC indicator, needs to be able to access a comprehensive database in which all IXC 30 subscriber telephone numbers are stored. Database 351 serves this function for rating system 331.

FIG. 5 is a flowchart of the processing performed by rating system 331. The rating system receives the EMI record from EMI formatting system 321, as indicated at 501. The system then proceeds to "rate" the call, i.e., compute call charge 3418, as indicated at 504. Additional known functionalities may also be carried out by the rating system. Of interest here, however, is the generation of PIC indicator 3419. In particular, it is first determined at step 506 whether the originating subscriber is PIC'd to IXC 30. If not, there is no need to continue further inasmuch as PIC indicator 3419 will necessarily be in the "not set" state, as shown in FIG. 3. On the other hand, if the originating subscriber is PIC'd to IXC 30, then it is determined at step 508 whether the terminating subscriber is PIC'd to IXC 30. If the terminating subscriber is not PIC'd to IXC 30, then, again, PIC indicator 3419 will be left in the "not set" state. If, however, the terminating subscriber is PIC'd to IXC 30, then PIC indicator 3419 will be put in the "set" state, as indicated at step 511. After perhaps performing various other functions not relevant here, rating system 331 transfers, or transmits, the now rated and PIC-evaluated EMI message to a billing system for subsequent processing. (In the event that only the terminating subscriber's PIC is used to determine the state of the PIC indicator, as shown in FIG. 7, the flowchart of FIG. 5 would be modified to the extent of simply eliminating step 506.)

There are at least two possible types of billing systems to which the EMI messages may be transferred by rating system 331. Each LEC includes a LEC billing system, such as LEC billing systems 24 and 44 within LECs 20 and 40, respectively. To the extent that call charges from IXC 30 are included within the bills rendered by a subscriber's LEC, the EMI records for calls to be billed to that subscriber are transferred to a LEC billing system. Alternatively, IXC 30 may render separate bills to at least ones of its subscribers. The EMI records for calls to be billed to such subscribers, instead of being transferred to a LEC billing system, are transferred to one of IXC billing systems 361 . . . 362 maintained and operated by the carrier itself. IXC billing system 361, for example, serves rating system 331 in this regard. IXC billing system 361 may thereupon print and mail a separate bill for IXC 30 charges. Alternatively, instead of printing and mailing its own bills for calls whose EMI records were transferred to IXC billing system 361, IXC 30 may use its billing system to totalize the bills—and in the process, apply any applicable discounts—and then provide an invoice in electronic form to the LEC billing system for ultimate printing of the bill and inclusion thereof in the overall billing package mailed to the subscriber.

FIG. 6 is a simplified flowchart of the processing performed by, for example, LEC billing system 24 in the rendering of printed bills on, for example, a monthly basis. At step 601 the message records for a particular subscriber are retrieved from memory on a per-carrier basis (the carriers including not only any interexchange carrier that the subscriber may have used during the billing period but also the local exchange carrier itself). Next, as indicated at step 603, the charges are totalized on a per carrier basis. In the totalization of the charges from IXC 30, in particular, the PIC indicators in the message records are used as the basis for applying any desired special billing treatment, such as a discount for those calls whose PIC indicator is in the "set" state. Thus, in that case, a subscriber PIC'd to IXC 30 will receive a discount for long-distance calls made to another subscriber who is also PIC'd to IXC 30. The discount percentage may be based, for example, on the total dollar volume of the calls in question. Finally, the LEC billing system prints the bill for this subscriber at step 606 and then returns to step 601 to begin the processing for the next subscriber.

The forgoing merely illustrates the principles of the invention. Thus, for example, although the invention is illustrated in the context of a particular type of billing environment made up of various discrete systems, those skilled in the art will be able to implement the invention in any of a variety of telephone billing environments.

Moreover, the invention is applicable to IXC calls made made both a) between so-called local access and transport areas, or lata's—a so-called inter-lata call, and b) within an individual lata (to the extent that intra-lata IXC facilities are actually available)—a so-called intra-lata call. Thus in the illustrative embodiment of FIG. 1, IXC originating and terminating switches 301 and 302 may be within the same lata or in different lata's. Subscribers may be PIC'd to one carrier for inter-lata calls and to another carrier (which may be, for example, an IXC or a LEC) for intra-lata calls, as would be reflected in the global databases maintained by the LECs. In this context, the term "long-distance" call simply refers to any call carried by an IXC.

It will thus be appreciated that those skilled in the art will be able to devise numerous arrangements which, although not explicitly shown or described herein, embody the principles of the invention and are within its spirit and scope.

We claim:

1. A method for use in a telecommunications system in which interexchange calls initiated by each subscriber are automatically routed over the facilities of a particular one of a plurality of interexchange carriers associated with that subscriber, said method comprising the steps of:

generating a message record for an interexchange call between an originating subscriber and a terminating subscriber, and

including, in said message record, a primary interexchange carrier (PIC) indicator having a value which is a function of whether or not the interexchange carrier associated with said terminating subscriber is a predetermined one of said interexchange carriers.

2. The invention of claim 1 wherein said value of said PIC indicator is a further function of whether or not the interexchange carrier associated with said originating subscriber is said predetermined one of said interexchange carriers.

3. The invention of claim 2 wherein said predetermined one of said interexchange carriers is the interexchange carrier over whose facilities said call was routed.

4. The invention of claim 1 wherein said including step comprises the step of accessing a database in which are stored the telephone numbers of substantially all of the subscribers associated with said predetermined one of said interexchange carriers.

5. The invention of claim 1 comprising the further step of transmitting each said message record to a billing system.

6. The invention of claim 1 comprising the further step of billing at least ones of said calls as a function of the value of the PIC indicator in the message record generated for each one of those calls.

7. The invention of claim 1 wherein said message record is an exchange message interface (EMI) message record.

8. The invention of claim 1 wherein said PIC indicator has a particular value when the interexchange carrier associated with said terminating subscriber is the interexchange carrier over whose facilities said call was routed, wherein said message record generating step includes the step of rating said call to determine a rated charge therefor and wherein said method includes the further step of billing an amount for said call which is less than said rated charge if the PIC indicator in the message record generated for said call has said particular value.

9. The invention of claim 8 wherein said message record generating step includes the steps of generating an automatic message account (AMA) message record for said call, converting said AMA message record into an exchange message interface (EMI) message record, transmitting the EMI message record to a call rating system, and rating said call in said call rating system, said including step being carried out by said call rating system and substantially contemporaneously with said call rating step.

10. The invention of claim 2 wherein said PIC indicator has a particular value when the interexchange carrier associated with both said terminating subscriber and said originating subscriber is the interexchange carrier over whose facilities said call was routed, wherein said message record generating step includes the step of rating said call to determine a rated charge therefor and wherein said method includes the further step of billing an amount for said call which is less than said rated charge if the PIC indicator in the message record generated for said call has said particular value.

11. The invention of claim 10 wherein said message record generating step includes the steps of generating an automatic message account (AMA) message record for said call, converting said AMA message record into an exchange message interface (EMI) message record, transmitting the EMI message record to a call rating system, and rating said call in said call rating system, said including step being carried out by said call rating system and substantially contemporaneously with said call rating step.

12. A method for use in a telecommunications system in which each subscriber has a primary interexchange carrier (PIC) over which interexchange calls initiated by that subscriber are carried, said method comprising the steps of:

generating a message record for each interexchange call between an originating subscriber and a terminating subscriber for which a charge is to be imposed, and

providing, in said message record, an indication which has a particular value when the particular interexchange carrier over which said call was carried is the PIC for said terminating subscriber.

13. The invention of claim 12 wherein said providing step includes the step of accessing a database in which are stored the telephone numbers of substantially all of the subscribers associated with said particular interexchange carrier.

14. The invention of claim 13 comprising the further step of transmitting each said message record to a billing system.

15. The invention of claim 13 comprising the further step of billing at least ones of said calls as a function of the value of said indication in the message record for each one of those calls.

16. The invention of claim 15 wherein said message record generating step includes the step of rating said each call to determine a rated charge therefor and wherein said billing step includes billing an amount for ones of said calls which is less than said rated charge if the indications in the message records for such calls have said particular value.

17. The invention of claim 16 wherein said message record generating step includes the steps of generating an automatic message account (AMA) message record for said call, converting said AMA message record into an exchange message interface (EMI) message record, transmitting the EMI message record to a call rating system, and rating said call in said call rating system, said indication providing step being carried out by said rating system and substantially contemporaneously with said call rating step.

18. A method for use in a telecommunications system in which each subscriber has a primary interexchange carrier (PIC) over which interexchange calls initiated by that subscriber are carried, said method comprising the steps of:

generating a message record for each interexchange call between an originating subscriber and a terminating subscriber for which a charge is to be imposed, and

providing, in said message record, an indication which has a particular value when the particular interexchange carrier over which said call was

carried is the PIC for said terminating subscriber and is also the PIC for said originating subscriber.

19. The invention of claim 18 wherein said providing step includes the step of accessing a database in which are stored the telephone numbers of substantially all of the subscribers associated with said particular interexchange carrier.

20. The invention of claim 19 comprising the further step of transmitting each said message record to a billing system.

21. The invention of claim 19 comprising the further step of billing at least ones of said calls as a function of the value of said indication in the message record for each one of those calls.

22. The invention of claim 21 wherein said message record generating step includes the step of rating said each call to determine a rated charge therefor and wherein said billing step includes billing an amount for ones of said calls which is less than said rated charge if the indications in the message records for such calls have said particular value.

23. The invention of claim 22 wherein said message record generating step includes the steps of generating an automatic message account (AMA) message record for said call, converting said AMA message record into an exchange message interface (EMI) message record, transmitting the EMI message record to a call rating system, and rating said call in said call rating system, said indication providing step being carried out by said rating system and substantially contemporaneously with said call rating step.

24. A method for use in a telecommunications system comprised of local exchange carriers and interexchange carriers, said system being arranged to establish telephone connections between subscribers of said local exchange carriers in response to requests for same, some of said connections including said interexchange carriers, each local exchange including a database in which is stored, for each subscriber of that local exchange carrier, the identity of a particular one of said interexchange carriers associated with that subscriber, and each local exchange carrier being arranged to respond to said requests by a) determining for each request whether the requested connection needs to include one of said interexchange carriers; b) if it does, for accessing said database to identify the interexchange carrier associated with the requesting subscriber; and c) including the identified interexchange carrier in the connection, said method comprising the steps of:

generating an exchange message interface (EMI) message record for at least each connection between an originating subscriber and a terminating subscriber which includes a particular one of said interexchange carriers and for which a charge is to be billed, and

providing, in said EMI message record, a primary exchange carrier (PIC) indicator whose value is a function of whether or not the particular interexchange carrier included in said each connection is the interexchange carrier associated with said terminating subscriber.

25. The invention of claim 24 wherein said value of said PIC indicator is a further function of whether or not the particular interexchange carrier included in said each connection is the interexchange carrier associated with said originating subscriber.

26. The invention of claim 24 wherein said providing step comprises the step of accessing a database in which are stored the telephone numbers of substantially all of the subscribers associated with said particular interexchange carrier.

27. The invention of claim 26 comprising the further step of computing charges for at least ones of said connections as a function of the value of the PIC indicator in the message record generated for those connections.

28. The invention of claim 26 wherein said PIC indicator has a particular value when the interexchange carrier associated with said terminating subscriber is said particular interexchange carder, wherein said message record generating step includes the step of rating said each connection to determine a rated charge therefor and wherein said method includes the further step of computing as said charge to be billed a charge which is less than said rated charge if the PIC indicator in the message record generated for said each connection has said particular value.

29. The invention of claim 24 wherein said PIC indicator has a particular value when the interexchange carrier associated with both said terminating subscriber and said originating subscriber is wherein said message record generating step includes the step of rating said each connection to determine a rated charge therefor and wherein said method includes the further step of computing as said charge to be billed a charge which is less than said rated charge if the PIC indicator in the message record generated for said each connection has said particular value.

30. Apparatus for use in a telecommunications system in which interexchange calls initiated by each subscriber are automatically routed over the facilities of a particular one of a plurality of interexchange carriers associated with that subscriber, said apparatus comprising:

means for generating a message record for an interexchange call between an originating subscriber and a terminating subscriber, and

means for providing in said message record a primary exchange carrier (PIC) indicator having a value which is a function of whether or not the interexchange carrier associated with said terminating subscriber is a predetermined one of said interexchange carriers.

31. The invention of claim 30 wherein said predetermined one of said interexchange carriers is the interexchange carrier over whose facilities said call was routed.

32. The invention of claim 31 further comprising a database in which are stored the telephone numbers of substantially all of the subscribers associated with said predetermined one of said interexchange carriers and wherein said providing means is arranged to access said database in the course of determining a value for said PIC indicator.

33. The invention of claim 32 further comprising means for billing at least ones of said calls as a function of the value of the PIC indicator in the message record generated for each one of those calls.

34. The invention of claim 30 wherein said PIC indicator has a particular value when the interexchange carrier associated with said terminating subscriber is the interexchange carrier over whose facilities said call was routed, wherein said message record generating means is arranged to rate said call to determine a rated cost therefor and wherein said apparatus further includes means for billing an amount for said call which is less

than said rated cost if the PIC indicator in the message record generated for said call has said particular value.

35. The invention of claim 30 wherein said value of said PIC indicator is a further function of whether or not the interexchange carder associated with said originating subscriber is said predetermined one of said interexchange carriers.

36. The invention of claim 35 wherein said predetermined one of said interexchange carriers is the interexchange carrier over whose facilities said call was routed.

37. The invention of claim 36 further comprising a database in which are stored the telephone numbers of substantially all of the subscribers associated with said predetermined one of said interexchange carriers and wherein said providing means is arranged to access said database in the course of determining a value for said PIC indicator.

38. The invention of claim 37 further comprising means for billing at least ones of said calls as a function of the value of the PIC indicator in the message record generated for each one of those calls.

39. The invention of claim 36 wherein said PIC indicator has a particular value when the interexchange carrier associated with both said terminating subscriber and said originating subscriber is the interexchange carrier over whose facilities said call was routed, wherein said message record generating means is arranged to rate said call to determine a rated cost therefor and wherein said apparatus further includes means for billing an amount for said call which is less than said rated cost if the PIC indicator in the message record generated for said call has said particular value.

40. A method for use in a telecommunications system in which interexchange calls initiated by each subscriber are automatically routed over the facilities of a particular one of a plurality of interexchange carriers associated with that subscriber, said method comprising the steps of:

generating a message record for an interexchange call between an originating subscriber and a terminating subscriber,

accessing a database in which are stored the telephone numbers of substantially all of the subscribers associated with the specific one of said interexchange carriers over which said call was routed to make a determination as to whether or not the interexchange carrier associated with said terminating subscriber is said specific interexchange carrier over whose facilities said call was routed,

establishing an indicator for said call at a particular value when said determination is that the interexchange carrier associated with said terminating subscriber is said specific interexchange carrier over whose facilities said call was routed, and

providing an output which is a function of both information in said message record and of said indicator.

41. The method of claim 40 wherein said processing step includes the steps of:

rating said call as a function of information in said message record to determine a rated charge therefor, and

billing an amount for said call which is less than said rated charge if said indicator has said particular value.

* * * * *

Supreme Court, U.S.
FILED
AUG 12 1999

No. 99-095

IN THE
Supreme Court of the United States

EXCEL COMMUNICATIONS, INC.,
EXCEL COMMUNICATIONS MARKETING, INC.,
AND EXCEL TELECOMMUNICATIONS, INC.,
Petitioners,

v.

AT&T CORP.,
Respondent.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

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August 12, 1999

WILSON - EPES PRINTING CO., INC. - 789-0096 - WASHINGTON, D.C. 20001

QUESTION PRESENTED

Whether the court of appeals erred in concluding that a patent claim expressly limited to an electronic process for generating an enhanced message record—a specific, tangible, and useful electronic data structure that records information concerning a particular long-distance telephone call—claims a "new and useful process" and therefore involves subject matter that is patentable under 35 U.S.C. § 101.

CORPORATE DISCLOSURE STATEMENT

Pursuant to Supreme Court Rule 29.6, AT&T Corp. has no parent corporation. No publicly held company owns 10% or more of AT&T Corp.'s stock.

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IN THE

Supreme Court of the United States

No. 99-095

EXCEL COMMUNICATIONS, INC., EXCEL COMMUNICATIONS MARKETING, INC., AND EXCEL TELECOMMUNICATIONS, INC.,
Petitioners,

v.

AT&T CORP.,
Respondent.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

RESPONDENT'S BRIEF IN OPPOSITION

AT&T Corp. ("AT&T") respectfully submits this brief in opposition to the petition for a writ of certiorari filed by Excel Communications, Inc. and others (collectively "Excel"). The decision below was an interlocutory, correct, and fact-specific application of the standard for patentable subject matter set forth in *Diamond* v. *Diehr*, 450 U.S. 175 (1981). Accordingly, this Court should deny the petition.

First, contrary to Excel's representations, this case does not involve, and the Federal Circuit therefore did not uphold, patent claims directed to "pure processes of manipulating data according to mathematical formulas." (Pet. 1.) Rather, each of the patent claims at issue

recites an electronic process for generating an enhanced message record, a specific electronic data structure that is useful to an interexchange telecommunications carrier because it records information about individual long-distance telephone calls. The court of appeals correctly applied the *Diehr* standard to the specific invention claimed in the patent, and concluded that "on its face the claimed process comfortably falls within the scope of § 101." (Pet. App. 13a.) Second, Excel's focus is on a supposed change in circuit law, a matter that does not ordinarily warrant review by this Court. Moreover, this case would not be a proper vehicle for such review in any event because, even if the court of appeals had applied Excel's preferred "*Freeman-Walter-Abele* test," Excel still would not have prevailed. This is so because the claimed invention includes the physical process steps required under the *Freeman-Walter-Abele* formulation of the § 101 standard. Finally, the current interlocutory posture of the case militates against this Court's review. The court of appeals ruled on Excel's motion for summary judgment. On remand from the court of appeals, the district court has ordered the case to trial on November 1, 1999. The issues to be tried include Excel's additional invalidity defenses, as well as AT&T's claims of infringement. As a result, the question that Excel now poses for review may well become moot. Therefore, the Federal Circuit's decision does not present any question worthy of review.

COUNTERSTATEMENT OF THE CASE

Excel's statement of the case contains a number of misleading statements. Three specific corrections are necessary for present purposes: First, AT&T's patent does *not* contain claims drawn to "pure processes of manipulating data according to mathematical formulas or algorithms."

(Pet. 1.) Rather, the claims recite physical processes for generating specific enhanced message records, electronic data structures representing individual long-distance telephone calls that aid in billing such calls and thus are useful to telecommunications firms that provide long-distance service. Contrary to Excel's representations, the product of the patented processes is not the solution to a mathematical problem, but a tangible, electronically-generated data structure that represents the physical event of a specific long-distance telephone call. Second, the Federal Circuit neither "adopted a new standard that dramatically expands the scope of patentable subject matter," nor applied a test "which requires no more than some practical usefulness of the result of [a] mathematical manipulation." (*Id.*) Instead, after a thorough discussion of the standard set forth in *Diamond* v. *Diehr*, 450 U.S. 175, 181-92 (1981), the Federal Circuit applied that standard to the particular patent claims at issue and concluded that each "falls within the scope of § 101." (Pet. App. 6a-12a (discussing *Diehr* standard), 12a-17a (applying *Diehr* standard).) Third, Excel's description of this case's posture is incomplete. Specifically, Excel fails to note that this case is scheduled for trial in November 1999, and that the further proceedings in the case may moot any § 101 issue altogether.

1. The patent at issue here, U.S. Patent No. 5,333,184 ("the '184 patent"), relates to the creation of a specific type of electronic data structure—a "message record"—that is useful to firms that provide long-distance telephone service. (Pat. Doc. App. 1 (stating that the claimed invention "relates to the generation of message records for long-distance—or so-called interexchange—calls," which are enhanced by "the addition of a primary interexchange carrier (PIC) indicator").) In order to appreciate the concreteness of the processes as actually

described and claimed in the '184 patent, it is useful to review some basic facts about the telecommunications system for which the claimed invention was developed. Figure 1 of the '184 patent illustrates the basic "equal access" telecommunications system within which the claimed invention operates (*id.* at 2), and the specification of the '184 patent explains the operation of the claimed process in detail (*id.* at 7-9).

Both local and long-distance telephone services were transformed following AT&T's 1984 divestiture of its local telephone companies. What had been a largely unitary system was split into two connected parts: (1) local exchange carriers, or "LECs," which provide local telephone service and access to long-distance telephone service, and (2) interexchange carriers, or "IXCs," which provide long-distance telephone service. (Pet. App. 2a-3a). As a result of the divestiture, telephone customers now obtain service from at least two providers—a LEC and an IXC. (Pat. Doc. App. 7 (col. 1, lines 30-50).) Within this two-provider framework, which is predicated on the customer's equal access to IXCs for direct-dialed long-distance calls (1 + area code + number), each customer chooses a primary interexchange carrier, or PIC. The LEC then sends a customer's direct-dialed long-distance calls to the facilities used by that customer's preselected PIC, over which the calls are automatically routed. (*Id.* at 7 (col. 1, lines 35-45); Pet. App. 3a.)[1]

In this system, when a customer places a long-distance call by dialing "1" plus the area code and number, the call is first transmitted over the LEC's network to one

[1] For example, when a newly-arrived resident of Washington, D.C. obtains local telephone service from Bell Atlantic, she also preselects a particular long-distance carrier (*e.g.*, AT&T, MCI, Sprint, etc.) to be her PIC.

of the LEC's switches. The LEC switching equipment that connects the caller to the local telephone network identifies the caller's PIC through the use of an internal database. Once the LEC's facilities have identified the caller's PIC, the call is automatically routed over the interexchange facilities that handle the traffic of that PIC. The call is carried over the facilities used by the caller's PIC—*i.e.*, the cable, fiber optic lines, microwave facilities, and interexchange switches—to the local exchange carrier that serves the called party. The terminating LEC then delivers the call over its local network to the called party. (Pat. Doc. App. 7-8 (cols. 1-3); Pet. App. 3a.) It is plain, then, that many long-distance calls made in the equal access telecommunications system involve three separate carriers: the originating LEC, the terminating LEC, *and* an IXC. This is the "telecommunications system" in which the processes claimed in the '184 patent were invented to operate. (Pat. Doc. App. 10-12 (claiming "method[s] for use in a telecommunications system").)

During a long-distance call, a switch (which may be a switch in the interexchange network) monitors and records data about the call. For each completed call, the switch generates an electronic data structure known generally in the industry as a "message record."[2] The message record contains data fields for specific information, such as the duration of the call, and the message record

[2] Excel conceded in the district court, in a glossary that it created of technical terms used in the patent, that a "message record" is "[a]n electronically generated record having fields that contain Information used when billing charges for Long-Distance telephone calls." (Resp. App. 2a.) Excel also conceded that "generating a message record," as claimed in the patent, entails "electronically producing a record of the characteristics of that call" by means of a "[s]witch." (*Id.*; *see also* Pet. 3 (message record is an "electronic record" of a long-distance call "generated by the switch for later billing or other purposes").)

physically organizes the data that represent a particular long-distance telephone call in a manner that enables subsequent operations that are conducted by an IXC (such as rating and billing the call) to be conducted with greater efficiency. (Pat. Doc. App. 7 (col. 1, lines 10-14); Pet. App. 3a.) "Because the message records are stored in electronic format, they can be transmitted from one computer system to another and reformatted to ease processing of the information." (Pet. App. 3a.) Figure 2 of the '184 patent represents the fields contained in one type of electronic message record for an interexchange call—namely, a message record that has been enhanced by the addition of the PIC indicator of the claimed invention. (Pat. Doc. App. 3.)

In the processes claimed in the '184 patent, the switches, computers, and other equipment in the telecommunications system generate an *enhanced* message record. As the Federal Circuit explained, "[t]he invention of the '184 patent calls for the addition of a data field into a standard message record to indicate whether a call involves a particular PIC (the 'PIC indicator')." (Pet. App. 4a.) The enhanced message record's PIC indicator is a physical representation within the new electronic data structure of whether, for a particular long-distance call, the called party has selected a predetermined long-distance company as his or her PIC. The Federal Circuit summarized the matter as follows: "AT&T's claimed process employs subscribers' and call recipients' PICs as data, applies Boolean algebra to those data to determine the value of the PIC indicator, and applies that value through switching and recording mechanisms *to create a signal useful for billing purposes*." (*Id.* at 12a (emphasis added).) Before the invention claimed in the '184 patent, this representation was not part of an interexchange message record

structure, nor was the supporting database architecture and software designed to make the underlying information it represents readily accessible to IXCs.

Excel repeatedly attempts to disparage the claims of the '184 patent as "pure method claims" (see, *e.g.*, Pet. 5) and "pure process claims" (see, *e.g.*, *id.* at 10), slogans that Excel has coined for its petition. From the outset, Excel mischaracterizes the claimed processes as "method[s] of manipulating data according to a mathematical operation" (*id.* at i)—specifically, formulae from "Boolean mathematics" (*id.* at 4), which Excel likens to such abstract concepts as the Pythagorean Theorem (*id.* at 25). Excel simply ignores the fact that each of the claimed processes expressly requires, among other things, a particular "interexchange call[]." (Pat. Doc. App. 10-12.) In the absence of a specific interexchange call, the claimed processes could not be performed. Indeed, they would make no sense. There can be no message record, no PIC indicator, and no billing without a particular long-distance call. Nor can Excel reasonably deny that an interexchange call is a physical event that takes place in physical telecommunications facilities; the '184 patent describes these very sorts of facilities. (*Id.* at 7-9.) And, as noted above (p. 5 n.2), Excel conceded below that a message record, the product of the processes claimed in the '184 patent, is electronically generated by the switches, computers, and other equipment and facilities used by interexchange telephone carriers. In short, the claimed processes employ physical, electronic steps to transform physical events—specific long-distance telephone calls—into different physical things—enhanced electronic message records that represent those calls.

2. Excel's primary complaint is that the Federal Circuit has changed its own articulation of the standard for patentability under § 101.

Even a cursory reading of the Federal Circuit's decision reveals that the court's rearticulation was made specifically to comply with this Court's precedents and to provide a more workable standard for the lower courts than that provided in prior Federal Circuit decisions. After reviewing the specifics of the inventions claimed in the '184 patent (Pet. App. 2a-5a), the court of appeals began with the language of 35 U.S.C. § 101 and this Court's broad construction of that provision in *Diamond* v. *Chakrabarty*, 447 U.S. 303 (1980), and *Diamond* v. *Diehr*, 450 U.S. 175 (1981). (Pet. App. 6a-7a.) Mindful that "[a] mathematical formula alone, sometimes referred to as a mathematical algorithm, viewed in the abstract, is considered unpatentable subject matter" (*id.* at 7a (citing *Diehr*, *Parker* v. *Flook*, 437 U.S. 584 (1978), and *Gottschalk* v. *Benson*, 409 U.S. 63 (1972)), the Federal Circuit surveyed some of the changes in its own case law since the late 1960s as the Patent and Trademark Office ("PTO") responded to the fact that "the process of manipulation of numbers is a fundamental part of computer technology." (*Id.* at 8a-9a; see also *id.* at 14a-17a.) Importantly, the Federal Circuit expressly recognized that, in *Diehr*, this Court "supported and enhanced this effort." (*Id.* at 9a (discussing facts, reasoning, and conclusion of *Diehr*).)[3] In light of all the case law, including its own decisions in *State Street Bank & Trust Co.* v. *Signature Fin. Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998), *cert. denied*, 119 S. Ct. 851 (1999), and *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994) (in banc), the court of appeals concluded that § 101 "requires an examination of the contested claims to see if the claimed subject matter

[3] Thus, the "sea-changes" in law and technology that the Federal Circuit described in its opinion (Pet. App. 8a) referred, not to its decision in this case, as Excel mistakenly asserts (Pet. 2), but to a series of developments from the 1960s to the present, including this Court's decision in *Diehr* (*see* Pet. App. 8a-9a).

as a whole is a disembodied mathematical concept representing nothing more than a 'law of nature' or an 'abstract idea,' " in which case it is not patentable, "or if the mathematical concept has been reduced to some practical application rendering it 'useful,' " in which case it is patentable. (Pet. App. 11a.)

The court of appeals then conducted this required examination with respect to AT&T's claims to processes for generating an enhanced electronic message record. The court squarely rejected Excel's contention that the claimed processes were nothing more than mathematical formulae, recognizing that the processes claimed in the '184 patent use "switching and recording mechanisms to create a signal useful for billing purposes." (Pet. App. 12a.) Accordingly, the court unanimously held that the claimed processes easily pass muster under § 101:

> In this case, Excel argues, correctly, that the PIC indicator value is derived using a simple mathematical principle (p and q).[4] But that is not determinative because AT&T does not claim the Boolean principle as such or attempt to forestall its use in any other application. It is clear from the written description of the '184 patent that AT&T is only claiming a process that uses the Boolean principle in order to determine the value of the PIC indicator. The PIC indicator represents information about the call recipient's PIC, a useful, non-abstract result that

[4] AT&T disagrees with this description of this process step. The comparative operations that the claimed processes include, whether or not they can be termed "Boolean algebra," are not the type of mathematical formulae that have been excluded from patent protection. In *Gottschalk* v. *Benson*, this Court defined the excluded type of algorithm as "[a] procedure for solving a given type of mathematical problem." 409 U.S. 63, 65 (1972). The comparisons executed as steps in the processes claimed in the '184 patent do not involve a procedure for solving a mathematical problem.

> facilitates differential billing of long-distance calls made by an IXC's subscriber. Because *the claimed process applies the Boolean principle to produce a useful, concrete, tangible result* without pre-empting other uses of the mathematical principle, on its face the claimed process comfortably falls within the scope of § 101.

(*Id.* at 12a-13a (emphasis added).) The Federal Circuit thus embraced, rather than repudiated, *Diehr*. Indeed, the similarity in analysis is striking. See *Diehr*, 450 U.S. at 187 ("Their process admittedly employs a well-known mathematical equation, but they do not seek to pre-empt the use of that equation. Rather, they seek only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process [for curing rubber].").

3. Excel's statement of the case is incomplete in another crucial respect. Specifically, Excel does not acknowledge that the Federal Circuit's decision is purely interlocutory. The Federal Circuit reversed the district court's grant of summary judgment in Excel's favor in April 1999. (Pet. App. 1a.) In June 1999, approximately one month before Excel filed the petition, the district court ordered that this case go to trial beginning on November 1, 1999. (Resp. App. 1a, ¶ 4.) The issues to be tried include infringement and Excel's remaining invalidity contentions. These further proceedings may render moot the § 101 issue presented in the petition.

REASONS FOR DENYING THE PETITION

The court of appeals' decision, viewed accurately, does not warrant review by this Court.

1. The question Excel poses—whether "a method of manipulating data according to a mathematical operation constitutes a patentable process" (Pet. i)—is simply not

presented in this case. Indeed, in order to pose such a question, Excel is forced to distort beyond recognition both the invention that is claimed in the patent in suit and the Federal Circuit's reasoning and conclusion upholding the claimed invention's patentability under 35 U.S.C. § 101, *supra* pp. 3-10. However, the claimed processes for electronically generating specific enhanced message records that correspond to particular long-distance telephone calls in an equal access telecommunications system were properly understood by the Federal Circuit under a faithful application of the standard of § 101 patentability laid down in *Diamond* v. *Diehr*, 450 U.S. 175 (1981), and its predecessors.

a. Section 101 of the Patent Act expressly extends patent protection to, among other things, "*any* new and *useful* process." 35 U.S.C. § 101 (emphasis added). As this Court explained in both *Diamond* v. *Chakrabarty*, 447 U.S. 303, 309 (1980), and *Diehr*, 450 U.S. at 182, "any" is an expansive term that encompasses " 'anything under the sun that is made by man.' " (Quoting S. Rep. No. 82-1979, at 5 (1952); H.R. Rep. No. 82-1923, at 6 (1952).) Moreover, "in dealing with the patent laws," this Court has "more than once cautioned that 'courts "should not read into the patent laws limitations and conditions which the legislature has not expressed." ' " *Diehr*, 450 U.S. at 182 (quoting *Chakrabarty*, 447 U.S. at 308).

In *Diehr*, this Court confronted the question "whether a process for curing synthetic rubber which includes in several of its steps the use of a mathematical formula and a programmed digital computer is patentable subject matter under 35 U.S.C. § 101." 450 U.S. at 177. The Court concluded that the inventors' 11 process claims, each of which expressly recited a mathematical formula for calculating the curing time for rubber known as "the Arrhenius equation," *id.* at 177, 179 n.5, were patentable under § 101.

After reviewing the broad language of § 101 and its decision on the scope of § 101 in *Chakrabarty* from the previous Term, *id.* at 181-84, the Court distilled its prior holdings: "Excluded from such patent protection are laws of nature, natural phenomena, and abstract ideas." *Id.* at 185; see also *Chakrabarty*, 447 U.S. at 309 ("Einstein could not patent his celebrated law that $E=mc^2$; nor could Newton have patented the law of gravity."). Conversely, "when a claim containing a mathematical formula implements or applies that formula in a structure *or process* which, when considered as a whole, is performing a function which the patent laws were designed to protect (*e.g.*, transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of § 101." *Diehr*, 450 U.S. at 192 (emphasis added). Put another way, "an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." *Id.* at 187.

The Court concluded that, in view of the foregoing principles, the claimed rubber-curing process constituted patentable subject matter. The Court reasoned as follows:

> [T]he respondents here do not seek to patent a mathematical formula. Instead, they seek patent protection for a process of curing synthetic rubber. Their process admittedly employs a well-known mathematical equation, but they do not seek to pre-empt the use of that equation. Rather, they seek only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process. These include installing rubber in a press, closing the mold, constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening

> the press at the proper time. Obviously, one does not need a "computer" to cure natural or synthetic rubber, but if the computer use incorporated in the process patent significantly lessens the possibility of "overcuring" or "undercuring," the process as a whole does not thereby become unpatentable subject matter.

Id.; see also *id.* at 191 ("We view respondents' claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula."). Likewise, in this case, the Federal Circuit correctly viewed AT&T's claimed invention as a process for generating enhanced electronic message records for long-distance telephone calls and not as an attempt to patent a mathematical formula.

b. The Federal Circuit's decision in this case is neither "a sharp break from the pre-existing law" (Pet. 15) nor "a repudiation of this Court's precedents" (*id.* at 18). Indeed, in language that tracks this Court's precedents virtually verbatim, the court of appeals applied the *Diehr* standard to the particular claims of the '184 patent and concluded that the claimed processes fall well within the definition of patentable subject matter. As noted above, the Federal Circuit upheld the patentability of the claims of the '184 patent only after concluding that the specific claimed processes were sufficiently concrete and "useful" to warrant patent protection. Contrary to Excel's contention that the claims recite nothing but mathematical formulae, the Federal Circuit specifically recognized that the claimed processes use "switching and recording mechanisms to create a signal useful for billing purposes." (Pet. App. 12a.) Next, the Federal Circuit, echoing this Court's analysis in *Diehr*, "focuse[d] on whether the mathematical algorithm" it found recited in the claims "is applied in a practical manner to produce a useful result."

(*Id.* at 16a.) According to the Federal Circuit, "AT&T does not claim the Boolean principle as such or attempt to forestall its use in any other application." (*Id.* at 13a.) Rather, "[b]ecause *the claimed process applies the Boolean principle to produce a useful, concrete, tangible result* without pre-empting other uses of the mathematical principle, on its face the claimed process comfortably falls within the scope of § 101." (*Id.* (emphasis added).) Again, the court of appeals' standard is essentially indistinguishable from that set forth in *Diehr*, 450 U.S. at 187.

Excel devotes considerable attention to the Federal Circuit's discussion of the "physical transformation" aspect of this Court's decision in *Diehr*, contending that the court of appeals discarded it as an element of the § 101 analysis. (Pet. 19-24.)[5] This Court will search the Federal Circuit's opinion in vain for the "repudiation" (*id.* at 22 n.11) claimed by Excel. To the contrary, the Federal Circuit cited its decision in *Arrhythmia Research Tech., Inc.* v. *Corazonix Corp.*, 958 F.2d 1053, 1058-61 (Fed. Cir. 1992), to explain that the transformation of electrical signals from one form into another can produce the useful, concrete, tangible result required for patentability under this Court's precedents. (Pet. App. 14a.) And, as noted above, the Federal Circuit, employing the *Diehr* analysis, correctly held that the claimed processes in this case effected the same sort of transformation, using "switching and recording mechanisms to create a signal useful for billing purposes" (*id.* at 12a).

[5] Excel, curiously, bases this contention on the Federal Circuit's description of physical transformation as an example, rather than an unvarying requirement, of a practical application of a mathematical algorithm. (Pet. 22 n.11.) Excel ignores the fact that this Court itself used this characterization in *Diehr*. *See* Pet. App. 13a-14a (quoting *Diehr*, 450 U.S. at 192); *see also Benson*, 409 U.S. at 71 (Court declines to hold that a process must change materials to a different state or thing to be patentable).)

Nor did the court of appeals disregard this Court's decisions in *Benson* and *Flook*, as Excel repeatedly asserts. To the contrary, the Federal Circuit cited both cases, along with *Diehr*, for the bedrock proposition that "[a] mathematical formula alone, sometimes referred to as a mathematical algorithm, viewed in the abstract, is considered unpatentable subject matter." (Pet. App. 7a.) Indeed, the Federal Circuit described *Benson* and *Flook* in the exact terms used by this Court in *Diehr*: "these cases did no more than confirm the 'long-established principle' that laws of nature, natural phenomena, and abstract ideas are excluded from patent protection." (*Id.* at 9a (quoting *Diehr*, 450 U.S. at 185); *Diehr*, 450 U.S. at 185 ("Our recent holdings in *Gottschalk* v. *Benson*, *supra*, and *Parker* v. *Flook*, *supra*, both of which are computer-related, stand for no more than these long-established principles.").) In contrast to the inventions claimed in the patents at issue in *Diehr* and in this case, in which mathematical algorithms are employed as part of a larger process to produce "a useful, concrete, tangible result" (Pet. App. 13a), this Court understood the inventions in *Benson* and *Flook* to involve nothing more than methods of mathematical calculation. See *Benson*, 409 U.S. at 71-72 (patent would cover a "formula for converting BCD numerals to pure binary numerals" and thus would "wholly pre-empt the mathematical formula"); *Parker* v. *Flook*, 437 U.S. 584, 594-95 (1978) (patent application "simply provides a new and presumably better method for calculating alarm limit values").[6] Excel is thus wrong to contend that the standard applied by the Federal Circuit in this case would have resulted in different outcomes in *Benson* and *Flook*. (Pet. 20.) Both *Benson* and

[6] *See also Diehr*, 450 U.S. at 185 (*Benson* claims covered "an algorithm used to convert binary code decimal numbers to equivalent pure binary numbers"); *id.* at 186 (*Flook* application "sought to protect a formula for computing this [alarm limit] number").

Flook applied the same standard articulated by this Court in *Diehr*: mathematical formulae as such are not patentable, 450 U.S. at 191, but claims that apply such formulae in processes that perform a function that the patent laws were designed to protect satisfy the threshold requirements of § 101, *id.* at 192.

In short, the court of appeals' decision in this case, far from treating this Court's precedents "as effectively defunct" (Pet. 23), faithfully implements the standard established in *Diehr* and its predecessors. Much as Excel strains to deny it, there is nothing new in the decision below.

c. Excel's real complaint appears to be that, in a case decided over a year ago, *State Street Bank & Trust Co.* v. *Signature Fin. Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998), *cert. denied*, 119 S. Ct. 851 (1999), the Federal Circuit set aside an awkward and confusing formulation of the § 101 inquiry known as the "*Freeman-Walter-Abele* test." *See State Street*, 149 F.3d at 1373-75 (explaining origin of and confusion caused by the test). The test is named for the three cases in which the Federal Circuit's predecessor, the U.S. Court of Customs and Patent Appeals, developed the analysis. The test was also applied by the Federal Circuit in *In re Grams*, 888 F.2d 835 (Fed. Cir. 1989), and *In re Schrader*, 22 F.3d 290 (Fed. Cir. 1994), as well as other cases.[7] (Pet. 12-18.) Excel devotes a substantial portion of its argument to the point, bemoaning the *State Street* decision throughout its petition. But Excel's complaint does not justify certiorari review because, as explained below, the court of appeals would

[7] Although Excel asserts (Pet. 12-18) that the decision below represents a dramatic break with the Federal Circuit's pre-1998 precedent—including, presumably, its *in banc* decision in *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994)—Excel did not seek *in banc* review in this case.

have concluded that the claimed invention is patentable subject matter even under the *Freeman-Walter-Abele* test that Excel apparently would have this Court adopt. *Infra* pp. 21-22. Moreover, Excel's argument trades on the untenable premise that the Federal Circuit should not be permitted to improve the manner in which it implements this Court's precedents by eliminating confusion in its own case law. This is not the law, nor should it be.

The *Freeman-Walter-Abele* test has never been adopted by this Court. As the Federal Circuit explained in *State Street*, it "was designed by the Court of Customs and Patent Appeals . . . to extract and identify unpatentable mathematical algorithms" from patent claims in an effort to identify unpatentable subject matter. 149 F.3d at 1373-74. But "[t]he test has been a source of much confusion." *Id.* at 1374 n.5. The confusion is not surprising, for the *Freeman-Walter-Abele* test's reliance on "extract[ion]" is at odds with *Diehr*'s unmistakable command that, "[i]n determining the eligibility of [one's] claimed process for patent protection under § 101, [the] claims *must be considered as a whole*." 450 U.S. at 188 (emphasis added). As the Federal Circuit explained in *State Street*,

> [t]he dispositive inquiry is whether the claim as a whole is directed to statutory subject matter. It is irrelevant that a claim may contain, as part of the whole, subject matter which would not be patentable by itself. "A claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program or digital computer."

149 F.3d at 1374 n.6 (quoting *Diehr*, 450 U.S. at 187). *State Street* simply returned to the touchstone of *Diehr* itself. This case simply applied *State Street*. (Pet. App. 15a.)

In the course of discussing *State Street*, Excel devotes considerable energy to an untenable attempt to es-

tablish that different patentability standards govern machines and processes. (Pet. 13-15, 18 & n.9.) But § 101 on its face treats all categories of patentable subject matter in the same fashion. 35 U.S.C. § 101 ("any new and useful process, machine, manufacture, or composition of matter"). This Court has done so as well. See, *e.g.*, *Diehr*, 450 U.S. at 192 ("a *structure or process* which, when considered as a whole, is performing a function which the patent laws were designed to protect") (emphasis added); *Benson*, 409 U.S. at 67-68 ("the same principle applies" to product and process claims). Indeed, any other interpretation of § 101 would make the patentability of an invention turn on the skill of the application's drafter rather than the substance of the invention. See *In re Johnson*, 589 F.2d 1070, 1077 (C.C.P.A. 1978) (the form of a claim, whether apparatus or process, "is often an exercise in drafting").

Excel also inexplicably criticizes the Federal Circuit's emphasis on whether or not the claimed invention, viewed as a whole, recites a "useful" process rather than an abstract idea. But Congress, not the Federal Circuit, wrote the criterion "useful" into § 101. In doing so, Congress tracked the Constitution's grant of the power to "promote the . . . useful Arts," U.S. Const. art. I, § 8, cl. 8, a tradition that dates to Thomas Jefferson's Patent Act of 1793, which defined statutory subject matter as "any new and useful art, machine, manufacture, or composition of matter, or any new or useful improvement" thereof. Act of Feb. 21, 1793, § 1, 1 Stat. 319; see *Chakrabarty*, 447 U.S. at 308-09 (discussing history of 35 U.S.C. § 101). "In 1952, when the patent laws were recodified, Congress replaced the word 'art' with 'process,' but otherwise left Jefferson's language intact." *Id.* at 309. To determine whether a new process produces a "useful" result is fully consistent with the statute, the Constitution, and *Diehr*. That is the bedrock of patentability.

d. Excel attempts to heighten the significance of this case by lamenting the increasing number of "software" patents issued by the PTO (Pet. 25). Not only are Excel's concerns misplaced, but they have nothing to do with this case and provide no justification for review by this Court.

First, the causal link Excel attempts to draw is nonexistent. According to Excel, "[t]he *State Street* decision 'appears to have set off a stampede to the patent office, which reports a 45 percent increase in the number of data processing and computer-related patents issued during its 1998 fiscal year, which ended on Sept. 30.'" (Pet. 25 (quoting John T. Aquino, *Patently Permissive*, A.B.A. J., May 1999, at 30, 30).) But as of fiscal year 1998, the PTO took an average of 27.8 months to grant a patent application in the "Communications and Information Processing" area. FY 1998 U.S. PTO Ann. Rep. 94 (Table 4). In other words, any patents that issued between the end of July 1998, when the Federal Circuit decided *State Street* (see 149 F.3d at 1368), and the September 30, 1998 PTO fiscal year-end were applied for long before the *State Street* decision. Indeed, the specific Internet-related patent that Excel disparages at page 28 of its petition, U.S. Patent No. 5,794,207, was applied for in September 1996, *i.e.*, approximately two years before *State Street*, and issued in August 1998.[8] The patent at issue in *State Street* itself (U.S. Patent No. 5,193,056) was applied for in March 1991 and issued in March 1993. Similarly, the patent in suit was applied for in May 1992 and issued in July 1994 (Pat. Doc. App. 1). And, just last Term this Court considered a case involving U.S. Patent No. 4,722,055, a computer-related patent with claims drawn to both processes and machines for funding

[8] The patents referenced above can be reviewed using the PTO's full-text patent database at http://www.uspto.gov/patft/index.html.

a future liability by means of an insurance investment program. See *College Sav. Bank* v. *Florida Prepaid Postsecondary Educ. Expense Bd.*, 148 F.3d 1343, 1345 (Fed. Cir. 1998), *rev'd*, 119 S. Ct. 2199 (1999). That patent was applied for in February 1987, *more than a decade* before the Federal Circuit's decision in *State Street*. In short, there is no causal link between the Federal Circuit's recent § 101 decisions and the supposed surge in the number of computer-related patents.

Second, even if the Federal Circuit's decision in *State Street* or this case were to cause an increased number of patent applications to be filed for computer-related inventions, that would not be a cause for alarm, much less certiorari. Whatever else computer-related patents may be, they are not new arrivals. Although Excel suggests that the patentability of "software" is an issue for Congress, Congress has already spoken in favor of broad protection for "any new and useful process," 35 U.S.C. § 101.

In sum, neither the case at bar nor *State Street* is evolutionary, much less—as Excel would have it—revolutionary. Rather, in both decisions the Federal Circuit has followed the path this Court laid out in *Diehr* and its predecessors, concluding that the particular inventions at issue in each case constitute patentable subject matter under § 101. To the extent the Federal Circuit may have enhanced its fidelity to *Diehr* by clarifying its formulation of the § 101 standard, that is a "refinement" of the type this Court has left to the Federal Circuit's "sound judgment in this area of its special expertise." *Warner-Jenkinson Co.* v. *Hilton Davis Chem. Co.*, 520 U.S. 17, 40 (1997) (declining to "micromanag[e] the Federal Circuit's particular word choice for analyzing" equivalent infringement under the doctrine of equivalents).

2. This case is not a proper vehicle for a retreat to the *Freeman-Walter-Abele* test, in any event, because the patent claims at issue would survive under that test as well.

Under the *Freeman-Walter-Abele* test, compliance with § 101 is determined according to a two-step analysis that first dissects, then reunites, the mathematical and physical portions of a patent claim as follows:

> First, the claim is analyzed to determine whether a mathematical algorithm is directly or indirectly recited. Next, if a mathematical algorithm is found, the claim as a whole is further analyzed to determine whether the algorithm is "applied in any manner to physical elements or process steps," and, if it is, it "passes muster under § 101."

In re Pardo, 684 F.2d 912, 915 (C.C.P.A. 1982) (quoting *In re Walter*, 618 F.2d 758, 767 (C.C.P.A. 1980)). In this case, the Federal Circuit concluded that the PIC indicator that is used to enhance the electronic message record in the claimed process "is derived using a simple mathematical principle (p and q)." (Pet. App. 12a.) What remains is to determine whether the claimed process, considered as a whole, applies the contained mathematical algorithm in any manner to physical elements or process steps. The processes claimed in the '184 patent clearly pass muster under this step of the *Freeman-Walter-Abele* test.

Each of the claims in suit involves physical process steps that result in a new and useful physical thing—namely, an electronic message record that represents a particular interexchange telephone call with a corresponding indicator that represents, at a minimum, whether the called party has chosen a particular PIC. Therefore, the results of applying the steps recited in each of the asserted claims are not disembodied concepts, but physical proc-

esses that transform individual long-distance telephone calls into long-distance telephone call message records that have been enhanced by a PIC indicator or are otherwise accompanied by an indication of the called party's PIC. (Pet. App. 2a-5a.) Put another way, it is evident that Boolean logical operations or mathematical computations alone, no matter how often repeated, could never produce an electronic message record that represents a specific long distance call, any more than they could produce a piece of cured rubber. As Excel conceded below (see p. 5 n.2 *supra*), an electronic message record, with or without a PIC indicator, can be generated only by physical process steps, using physical facilities, in response to a specific physical event (*i.e.*, a long-distance telephone call). The process of generating such a message record therefore is patentable subject matter.

3. Finally, apart from the merits, Excel's petition is premature because the Federal Circuit's decision is interlocutory. Since the Federal Circuit remanded this case to the district court in April 1999, the parties have continued the pretrial proceedings that were interrupted by the now-reversed summary judgment ruling. The district court, in an order issued approximately one month before Excel filed its petition, ordered that this case go to trial on November 1, 1999. (Resp. App. 1a, ¶ 4.) The issues to be tried include invalidity contentions other than Excel's § 101 defense, as well as AT&T's infringement claims. The trial may moot the § 101 issue and, if it does not, Excel can seek review following entry of a final judgment. See, *e.g.*, *Hughes Tool Co.* v. *Trans World Airlines, Inc.*, 409 U.S. 363, 365 n.1 (1973). Given the current posture of this case, this Court should deny Excel's certiorari petition.

CONCLUSION

For the foregoing reasons, the petition for a writ of certiorari should be denied.

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August 12, 1999

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APPENDICES

APPENDIX A

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

Civil Action No. 96-434 (SLR)

AT&T CORP.,

Plaintiff,

v.

EXCEL COMMUNICATIONS, INC.,
EXCEL COMMUNICATIONS MARKETING, INC.,
and EXCEL TELECOMMUNICATIONS, INC.,

Defendants.

SCHEDULING ORDER

The Court having conducted a telephonic status and scheduling conference on May 11, 1999;

IT IS ORDERED that:

1. No later than October 7, 1999, the parties shall (1) notify the Court of any previously-filed motions in limine that still require determination by the Court and (2) serve and file any additional motions in limine.

2. Responses to any motions in limine filed on October 7 shall be served and filed by October 14, 1999.

3. The final pretrial conference will be held at 4:00 p.m. on October 21, 1999.

4. A jury trial will begin on November 1, 1999.

Date: June 18, 1999 /s/ Sue L. Robinson
United States District Judge

APPENDIX B

(Excerpted from Excel's Summary Judgment Papers in the District Court)

APPENDIX B—GLOSSARY [1]

. . .

*** Generating A Message Record (See also Message Record)**

At the completion of a call, electronically producing a record of the characteristics of that call. A Switch initially generates the Message Record in AMA format. *See* '184 Patent, col. 3, lines 26-28. The AMA formatted Message Record can later be reformatted into an EMI formatted message record. *See* '184 Patent, col. 3, lines 35-41. A Message Record is generated in or adjunct to the Network, but prior to the Message Record being sent to the Billing System prior to billing. *See* '184 Patent, col. 4, lines 44-46; claims 5, 14, and 20; col. 1, lines 26-29.

. . .

*** Message Record**

An electronically generated record having fields that contain Information used when billing charges for Long-Distance telephone calls. This Information may include: the originating telephone number; the terminating telephone number; the billing tellephone number; the start time for the call; the lapsed time of the call; the geographic call origination and termination points; the charge for the call; a PIC indicator (see below) for the call, etc. *See* '184 Patent, col. 1, lines 6-29; col. 3, lines 26-28; col. 3, lines 35-41; col. 3, lines 49-54; col. 3, line 58-col. 4, line 10.

. . .

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[1] Asterisked entries are terms found in the '184 patent and are defined according to the Intrinsic Record—Entries with no asterisk are not found in the '184 patent but are helpful in understanding the issues in the case; some Extrinsic Evidence is relied upon to define these entries. Capitalized terms in a definition indicate that that term is also defined in the Glossary.

Supreme Court, U.S.
FILED
AUG 24 1999
OFFICE OF THE CLERK

No. 99-95

(3)

IN THE
Supreme Court of the United States

EXCEL COMMUNICATIONS, INC.,
EXCEL COMMUNICATIONS MARKETING, INC.,
AND EXCEL TELECOMMUNICATIONS, INC.,
Petitioners,

v.

AT&T CORP.,
Respondents.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

REPLY BRIEF FOR PETITIONERS

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REPLY BRIEF FOR PETITIONERS

A. The New Federal Circuit Standard For Patentable Processes Warrants Review

1. AT&T tries to deny the significance of the Federal Circuit's decision, claiming that "there is nothing new in the decision below." Opp. 16. Yet AT&T's own brief in opposition contradicts that claim. AT&T acknowledges that the Federal Circuit here adopted as a holding the *dicta* in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998), *cert. denied*, 119 S. Ct. 851 (1999), which "set aside" the previously applied physical-transformation requirement incorporated in what was known as the *Freeman-Walter-Abele* test. Opp. 16. And AT&T acknowledges that the physical-transformation standard had, in fact, been applied to hold various claimed processes invalid under Section 101. *Id.*

In any event, AT&T's ostrich-like claim that there is nothing "evolutionary, much less . . . revolutionary" in the new Federal Circuit standard (Opp. 20) is patently incorrect. The Federal Circuit itself recognized that *State Street* had "reassessed" Section 101 standards (Pet. App. 9a), and took pains to note that the district court here, in invalidating AT&T's patent claims, did not have the benefit of State Street's new standard (*id.* at 12a). Moreover, it dismissed the previous decisions invalidating process claims under Section 101—not by distinguishing them under an unaltered standard, but by simply stating that they pre-dated *State Street*'s repudiation of the "physical limitations analysis" (*id.* at 15a-17a).

Thus, it is widely recognized that the Federal Circuit has abandoned the previously governing physical-transformation requirement and, in its place, has adopted a standard of mere practical usefulness that substantially guts the

"mathematical algorithm" limitation on patentable "processes." As one commentator summarized the matter, the *State Street* decision

> expanded the scope of patentable subject matter under patent law by *essentially eliminating* the method of doing business exception and *the mathematical algorithm exception to patentable subject matter* (at least in the context of machine claims). More recently, in *AT&T Corp. v. Excel Communications, Inc.*, the Federal Circuit clarified that the broad interpretation of statutory subject matter under 35 U.S.C. § 101 (patentable subject matter) provided in [*State Street*] is not limited to machine (e.g., "means for" apparatus claims), but also applies to process (e.g., software algorithm) claims.

Michael Schallop, "Federal Circuit Clarifies That Useful Software-Related Inventions Are Patentable Processes," 4 No. 3 Cyberspace Lawyer 2 (May 1999) (footnotes omitted; emphasis added); *see* Barton E. Showalter & Jeffery D. Baxter, *Strategic Use of Software Patents*, in 19th Annual Institute on Computer Law, 547 PLI/PAT 1057, 1061 (1999) (stating that "the Federal Circuit in [*State Street*] essentially dismantled the so-called 'mathematical algorithm' exception").[1]

2. Nor is there any doubt that the practical consequences of the new standard are as significant as the doctrinal change wrought by the court of appeals. AT&T, acting as if only all-or-nothing changes matter, notes the obvious fact that software patents were "applied for" prior to *State Street* (Opp. 19)—and even, of course, some-

[1] *See, e.g.*, John Dragseth, "Patenting Methods of Doing Business: After State Street and AT&T, It's the Law," 2 No. 12 Wallstreetlawyer.com: Sec. Elec. Age 18 (May 1999) (stating that "on April 14, the Federal Circuit issued another opinion, *AT&T v. Excel Communications*, which reaffirmed and extended the holding in State Street" (footnote omitted)).

times were issued by the PTO. But AT&T cannot dispute the evidence that there has already been a dramatic increase in software patent applications—as a "byproduct" of *State Street*'s expressly intended dropping of the legal barriers to patentability, according to the Acting PTO Commissioner. *See* Q. Todd Dickinson, "The State of the PTO," speech to ABA dated June 24, 1999, *partly reprinted in* Legal Times (Aug. 16, 1999) ("We projected that in 1999 the number of applications would increase 7.2 percent over 1998 numbers, but in the year to date, we are seeing 11.5 percent growth. . . . Much of the increase will be in computer-related inventions. . . . [W]e also expect many more applications claiming methods of doing business as a byproduct of the Federal Circuit's decision in *State Street Bank* . . . .").[2]

This increase can hardly be predicted to abate, as the Federal Circuit's new standard necessarily encourages the filing of even more patent applications and lawsuits, not only because companies will seek to acquire a newly available competitive weapon, but because they must act defensively to protect themselves from others seeking to acquire and enforce patent rights against them.[3] Accord-

[2] *See, e.g.*, "In the News," 4 Cyberspace Law. 16 (May 1999) ("The floodgates [of patents] really opened after the Federal Circuit's decision in State Street Bank & Trust . . . ."); Showalter & Baxter, 547 PLI/Pat 1057, at 1065 (stating that "*State Street* likely signals the beginning of a modern-day gold rush as software developers clamor for patent protection to secure important market positions"); Carey R. Ramos & David S. Berlin, *Three Ways To Protect Computer Software*, 16 COMPUTER LAWYER 16, at *16 (1999) (describing current "madcap race among [software] developers to file as many patents as possible"); Paul Beck, *State Street Bank Case Causes Shock Waves in Banking and Financial Industry*, 147-JAN PITTSBURGH LEGAL J. 7, 7 (1998).

[3] A recent report from Silicon Valley quoted a venture capitalist: "'None of my companies seek patent protection because they actually think it will protect them from competition,' says David Cowan . . . . 'Rather, they seek patents to protect themselves from

ing to a recent observer reporting on the sharp increase in patent activity just in the computer software industry, it is the new legal standard first announced in *State Street* that "has ushered in the new wave of patent litigation—and pre-emptive armament," and that standard "has had wide repercussions in Silicon Valley, prompting valley companies to defend even mundane Internet software." Scott Herhold, *supra*. *See also* William T. Ellis and Aaron C. Chatterjee, "Shakeout on *State Street*: A seismic Federal Circuit precedent makes patents a potent financial services weapon," *IP Magazine* (Nov. 1998) (describing *State Street* as "one of the most important decisions relating to patentability of software—a decision that strongly suggests an immediate re-evaluation of the intellectual property strategy of every major company in the banking, insurance and financial industries").

In short, AT&T cannot deny the evident significance of the real-world "sea-change" effected by the Federal Circuit. Nor does it even try to address the policy questions —not addressed by Congress—that attend such an expansion of patent protection to previously unpatentable processes for manipulating data by mathematical operations. In particular, AT&T does not deny that the result is to saddle the PTO with applications that are especially likely to be issued erroneously, because prior art that exists is hard to find. The change in the governing legal standards, and the practical consequences of this change, are unmistakable.

3. Just as AT&T is wrong in trying to deny the fact and significance of the Federal Circuit's transformation of

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other people who have patents. It's a form of protection that frankly, I wish we didn't have.'" Scott Herhold, "Patent War Pending: Once-Arcane Field Emerges as Battleground Between Online Start-Ups and Established Companies," San Jose Mercury News (July 18, 1999). *See id.* ("In general, . . . Silicon Valley companies insist they're only playing defense.").

its own precedents—which have governed this area since this Court last addressed the matter almost 20 years ago, *see Diamond v. Diehr*, 450 U.S. 175 (1981); *Parker v. Flook*, 437 U.S. 584 (1978); *Gottschalk v. Benson*, 409 U.S. 63 (1972)—AT&T is wrong to suggest that this Court in *Diehr* already effected the elimination of the physical-transformation requirement, and substituted mere usefulness as a sufficient condition, which the Federal Circuit announced in *State Street* and adopted in the present case. Opp. 13-15. That suggestion is almost incomprehensible. It flies in the face of the undeniable fact that the physicial-transformation requirement, and the recognized insufficiency of mere limitation to a practical use, were part of the understanding of the Federal Circuit and its predecessors regarding *Diehr* for the two decades preceding *State Street* and this case.

In any event, the petition clearly sets out the reasons that *Diehr* cannot now be read as AT&T wishes. Nothing in *Diehr* repudiates the earlier holdings of *Benson* and *Flook*. The *Diehr* Court had no occasion to repudiate the physical-transformation requirement, as the case involved an undeniable process of physical transformation (changing the chemical state of rubber by curing). Indeed, the Court expressly relied on the centrality of the longstanding physical-transformation requirement in answering the crucial question of how one tells whether the line separating protectable from unprotectable processes has been crossed by a patentee's claim. 450 U.S. at 183-84 (quoting decision in *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1877), and ruling of *Benson*, 409 U.S. at 70, that physical transformation is "'the clue to the patentability of a process claim'"). The Court likewise expressly reiterated the *Flook* holding that merely "limiting the reach" of a mathematical operation "to a particular technological use" is not enough to bring the mathematical manipulation of

data within Section 101. 450 U.S. at 192 n.14. These are the very principles that the Federal Circuit has now disclaimed in collapsing the question of statutory subject matter into the distinct question of usefulness.[4]

Not surprisingly, then, it has been well recognized that *Diehr* itself preserved, rather than rejected, the requirement of a physical transformation to identify patentable processes. *See In re Schrader*, 22 F.3d 290, 295 (Fed. Cir. 1994) (noting that the "requirement that in a process claim compliance with § 101 requires some kind of transformation" is "cited with approval in *Diehr*"); *see also* Claus Melarti, *State Street Bank & Trust Co. v. Signature Financial Group, Inc.: Ought The Mathematical Algorithm And Business Method Exceptions Return To Business As Usual?*, 6 J. INTELL. PROP. L. 359, 368 (1999) (stating that "*Diamond* [*v. Diehr*] made clear that the physical transformation alluded to in *Gottschalk* [*v. Benson*] and *Parker* [*v. Flook*] was a prerequisite to such kinds of patent protection. Consequently, all software patents utilizing mathematical algorithms must satisfy this 'transformation inquiry' "); Wesley L. Austin, *Software Patents*, 7 TEX. INTELL. PROP. L.J. 225, 238 (1999) ("*Diehr* teaches that transformation and reduction of an

[4] Although AT&T pretends otherwise (Opp. 18), the appearance of "useful"—like the appearance of "new"—in Section 101 has never justified treating utility as a sufficient condition for a process (or apparatus, etc.) to be statutory subject matter. "Section 101 *states* three different requirements for patentability: novelty, utility and statutory subject matter. The understanding that these three requirements are *separate* and *distinct* is long-standing and has been universally accepted. . . . [T]he questions of whether a particular invention is *novel* or *useful* are questions wholly apart from whether the invention falls into a category of *statutory subject matter*." *In re Bergy*, 596 F.2d 952, 960 (C.C.P.A. 1979) (emphasis own); *see Flook*, 437 U.S. at 588 (assuming for purposes of Section 101 analysis that the invention "is novel and useful," but ultimately concluding that claims describe subject matter not eligible for patent protection).

article to a different state or thing is the clue to the patentability of a method claim."). Only by a deliberate act amounting to a declaration that this Court's precedents are outmoded could the Federal Circuit adopt its new standard. *Cf.* Michael Schallop, *supra* (gently characterizing the treatment of *Diehr* by the panel in the present case: "This interpretation is clearly broader than the holding or dicta of the Supreme Court's decision in *Diehr* . . . ."). As the petition explains, such disregard for this Court's precedents is impermissible and itself warrants review.

B. This Case Is A Good Vehicle For Review Of The Important Issue Raised In The Petition

AT&T does not deny that, although the Federal Circuit in *State Street* made the suggestion in *dicta* (because that case involved a machine claim),[5] this is the case in which the Federal Circuit definitively adopted, as governing precedent, the new anemic standard for patentability of processes under Section 101. *See* Michael Schallop, *supra*; Debra Freeman & Gabriel Meister, *Selected Intellectual Property Law Developments*, 4 ELEC. BANKING L. & COM. REP. 20 (May 1999) (*AT&T v. Excel* "followed and expanded upon the [Federal Circuit's] reasoning in *State Street*"). Because the law is now established in the Federal Circuit (*see* John Dragseth, *supra* ("with the two opinions representing the votes of five judges of the eleven-judge court, it is unlikely the law will change anytime soon")), this is the natural case for reviewing this important issue. Nevertheless, AT&T suggests that this is not a good vehicle for review because, AT&T says, the result would be the same under a different rationale (the physi-

[5] The court of appeals has recently confirmed that the claims at issue in *State Street* "claimed a machine" that was "made up of, at the very least, the specific structures disclosed in the written description and corresponding to the means-plus-function elements . . . recited in the claim." *WMS Gaming Inc. v. International Game Technology*, 51 U.S.P.Q.2d 1385, 1391 n.4 (Fed. Cir. 1999).

cal-transformation standard) from the one applied by the Federal Circuit, and Excel may yet prevail in invalidating the patent on some ground other than lack of patentable subject matter under Section 101. Opp. 21. Neither objection has any merit.

1. AT&T's argument that it would prevail under the physical-transformation standard (Opp. 21-22) provides no ground for this Court to avoid review of the Federal Circuit's express ground of decision. It is the expressed rationale that establishes the law of the Federal Circuit on the important issue presented. *See Matsushita Elec. Indus. Co., Ltd. v. Epstein*, 516 U.S. 367, 379 n.5 (1996) ("While it is true that a respondent may defend a judgment on alternative grounds, we generally do not address arguments that were not the basis for the decision below. See *Peralta v. Heights Medical Center, Inc.*, 485 U.S. 80, 86 (1988)."); *Carlucci v. Doe*, 488 U.S. 93, 104 n.6 (1988). Rather, the ordinary and proper course is to review the new announced standard of law and (as Excel contends) to articulate a corrected standard, then either apply the corrected standard or remand for application. *See, e.g., Kumho Tire Co., Ltd. v. Carmichael*, 119 S. Ct. 1167, 1176-79 (1999) (directly applying corrected standard (of appellate review) to case); *United States v. Lanier*, 520 U.S. 259, 272 (1997) (correcting legal standard and remanding "for application of the proper standard."); *Strickland v. Washington*, 466 U.S. 668, 698 (1984) (directly applying new standard).

In fact, the Federal Circuit's adoption of a new legal standard to replace the physical-transformation standard was hardly inadvertent or inconsequential for this case. AT&T not only made but stressed the argument that it would prevail under the physical-transformation standard in the court of appeals, yet the court pointedly refused to adopt AT&T's argument for reversal of the district court on this basis (even in the alternative). In responding to

Excel's specific argument that AT&T's patent failed under the physical-transformation standard, the Federal Circuit did not disagree, but instead rejected the "argument that physical limitations are necessary." Pet. App. 15a.

The court's refusal to endorse AT&T's argument reflects the strain of AT&T's effort at trying to pour its actual claims for data manipulation and recording into a physical-transformation mold. Reading the claims carefully, the court of appeals and the district court expressly recognized that the claimed method implements a fundamental mathematical operation. Pet. App. 12a-13a, 32a. The two lower courts also agreed that the claims do not recite processes for transforming a long-distance call (as AT&T bizarrely says, Opp. 7), or for generating an electronic message record *per se* (which itself constitutes nothing more than a format for arranging pieces of information), but instead claims a process of deriving a specific piece of data from other data (referred to in the patent as a "PIC indicator") and including it as an entry in an industry-standard message record generated for long-distance telephone calls. Pet. App. 4a, 24a. This process of data manipulation, though ancillary to a telephone call, no more satisfies the physical-transformation requirement than did the process of data manipulation (calculating an "alarm limit"), ancillary to an expressly recited process of catalytic conversion, held invalid in *Flook*. 437 U.S. at 594-95, 597-98. Thus, the crucial disagreement between the district court and court of appeals in this case—and the dispositive issue under Section 101—is the proper legal standard to be applied to the claims. The Federal Circuit's express rationale adopting a new legal standard is properly reviewed in this case.

2. AT&T's suggestion that this Court should pass over the important legal issue presented in Excel's petition because of its "interlocutory" nature (Opp. 22) is likewise

meritless, for multiple reasons. The Federal Circuit's ruling, if reversed, would end this case on a clean legal ground: invalidity of the patent claims for lack of patentable subject matter. In such circumstances, this Court has often granted review of dispositive legal issues notwithstanding the potential that other issues in a case might, through further proceedings, eventually result in a judgment for the petitioner on a different ground. *See, e.g., Harbor Tug and Barge Co. v. Papai*, 520 U.S. 548 (1997); *Yamaha Motor Corp. v. Calhoun*, 516 U.S. 199 (1996); *Mills v. Electric Auto-Lite Co.*, 396 U.S. 375 (1970).

Moreover, there is essentially no chance that this Court's consideration of the dispositive legal issue of Section 101 validity would become moot. First, although AT&T neglects to mention it, the district court, aware of this petition, has already indicated to the parties that in view of the dispositive nature of the Section 101 issue, it would seriously consider staying further proceedings in this case if the Court grants review. Second, even if a trial were to be held in November, the Section 101 issue would not become moot before its decision by this Court, which would occur, in the ordinary course, by June 2000 if review were granted at the start of the 1999 Term. Unless AT&T were to lose on validity at trial and, in addition, decide not to pursue post-trial motions and appellate review, the case—and, indeed, the validity of AT&T's patent—would still be open and alive upon decision of the Section 101 issue by this Court. Accordingly, this case is a good vehicle for review of the important question of patent law presented by the petition.

CONCLUSION

For the foregoing reasons, and the reasons set forth previously, the petition for a writ of certiorari should be granted.

Respectfully submitted,

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August 24, 1999

SUPREME COURT OF THE UNITED STATES

EXCEL COMMUNICATIONS, INC., ET AL.
v. AT&T CORP.

ON PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

No. 99–95. Decided October 12, 1999

The petition for a writ of certiorari is denied. Justice O'Connor took no part in the consideration or decision of this petition.

Statement of JUSTICE STEVENS respecting the denial of the petition for writ of certiorari.

The importance of the question presented in this certiorari petition makes it appropriate to reiterate the fact that the denial of the petition does not constitute a ruling on the merits. See *Carpenter* v. *Gomez*, 516 U. S. 981 (1995) (opinion of STEVENS, J., respecting denial of certiorari); *Maryland* v. *Baltimore Radio Show, Inc.*, 338 U. S. 912, 917–919 (1950) (opinion of Frankfurter, J., respecting denial of certiorari).